File No: LTD/1569

March 2012

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in Efka 4550

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/1569	BASF Australia Ltd	Polymer in Efka 4550	ND*	≤ 10 tonnes per annum	A component of industrial (automotive) 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 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 during spray painting:
  - Spray booths or closed systems

- 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)

  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 was provided by the applicant. 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, additives/adjuvants, use details, import volume and site of 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, Korea, USA, Canada

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Efka 4550 (product containing the notified polymer)

MOLECULAR WEIGHT
> 1,000 Da

ANALYTICAL DATA
Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY > 99%

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES
No losses by volatilisation, exudation or leaching are expected from the notified 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: yellowish liquid (product containing the notified polymer)

Property	Value	Data Source/Justification
Melting Point	Not determined	-
Boiling Point	approx. 100°C at 101.3 kPa (solvent)*	MSDS

Density	1060 kg/m^3 at 20ºC*	MSDS
Vapour Pressure	Not determined	Based on the high molecular weight, vapour pressure is expected to be low.
Water Solubility	Not determined	Expected to be water dispersible based on the presence of polar functionality and its use pattern in aqueous products
Hydrolysis as a Function of pH	Not determined	Contains functionality that hydrolyses slowly under environmental conditions (pH 4-9, 25 ºC)
Partition Coefficient (n-octanol/water)	Not determined	A low partition coefficient is likely on the basis of its water dispersability
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	Contains basic functionality (pKa ~ 7) which has the potential to be cationic under environmental conditions (pH 4-9)
Flash Point	Not determined	Not isolated from solution.
Autoignition Temperature	Not determined	Not isolated from solution.
Explosive Properties	Not determined	Contains no functional groups that imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that imply oxidative properties

*For imported product containing the notified polymer at < 50%.

DISCUSSION OF PROPERTIES

Reactivity

Expected to be stable under normal conditions. The MSDS of the imported product (< 50% notified polymer) notes that contact with strong acids, bases and oxidising agents should be avoided and that excessive temperatures should be avoided.

Dangerous Goods classification

Based on the limited 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 not be manufactured in Australia, but will be imported by sea as a component in the product Efka 4550 (< 50% notified polymer). This product will be imported in 25 kg and 180 kg steel drums by sea and stored at a third party warehouse until required for delivery to customers.

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

IDENTITY OF RECIPIENTS

BASF Australia Ltd

TRANSPORTATION AND PACKAGING
The notified polymer will be imported as a component of the imported product in 25 kg and 180 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 products will be transported by road from the wharf to the third party warehouse for storage and delivered to customers as required.

The finished paints containing the notified polymer will be stored and transported in steel 1 L, 4 L and 10 L paint cans and 210 kg steel drums.

USE
The product Efka 4550 containing the notified polymer at < 50% will function as a dispersing agent in water-based pigment concentrates and paints (< 5% notified polymer) for automotive original equipment manufacturer (OEM) use.

OPERATION DESCRIPTION
At coating formulation sites, the imported product containing the notified polymer (at < 50%) will be added, via a low-pressure transfer pump or gravity feed, to a high speed mixer and blended with the other paint components for up to 24 hours. Following quality control analysis, the formulated paints (containing < 5% notified polymer) will then be transferred (gravity feed or low-pressure pump) to containers for distribution to end-users. All processes will occur under exhaust ventilation.

The end-use paint products containing the notified polymer (at < 5%) will be used in OEM paint application facilities. The paints will be applied to vehicles by spray, brush and roller.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage	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 < 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 < 5% 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

Coatings containing the notified polymer at < 5% are intended for industrial use only and will not be sold to the public. Furthermore, once the coatings have cured and dried, the notified polymer will be reacted into the polymer matrix and will not be bioavailable.

6.2. Human Health Effects Assessment

No toxicity data were submitted. The notified polymer does not have any known structural alerts.

Toxicokinetics, metabolism and distribution.

The notified polymer is not expected to be dermally absorbed, based on the high molecular weight (> 1,000 Da) and low level of low molecular weight species.

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

During reformulation workers will handle the notified polymer at concentrations of < 50%, however exposure is expected to be low given the proposed use of PPE and largely enclosed, automated processes. During end use, there is potential for inhalation, dermal and ocular exposure to automobile paints containing the notified polymer at concentrations < 5%. Exposure to the notified polymer during end use applications is expected to be low due to the reduced concentration and the use of engineering controls and appropriate PPE. The risk of health effects from exposure to the notified polymer is expected to be further reduced by its high molecular weight (> 1,000 Da). 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. Water 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, specifically automotive original equipment manufacturers (OEMs). 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.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer in paints is expected to share the fate of metal and plastic articles to which it has been applied by automotive OEMs. 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 is 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 paint as part of its normal use pattern as a component in automotive OEM 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. 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. 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 = 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 component in automotive OEM 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 its limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edition [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

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

NTC (National Transport Commission) 2007 Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 7th Edition, Commonwealth of Australia

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 >.