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

PUBLIC REPORT

Polymer in LA-D 1405/1404

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 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.

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:

Street Address:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888
Website:	www.nicnas.gov.au

**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/1682	Evonik Australia Pty Ltd	Polymer in LA-D 1405/1404	ND*	< 25 tonnes per annum	Component of industrial coatings

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or 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 assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer:
 - Enclosed, automated processes, where possible
 - Spray application to be carried out in spray booths if possible
 - Spray application to be carried out in well ventilated environments
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
 - Avoid contact with skin and eyes
 - Do not inhale vapours or mists
 - Avoid contact with uncured coatings or overspray
- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Goggles
 - Impervious gloves
 - Coveralls
 - 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 Code of Practice for *Spray Painting and Powder Coating* (SWA, 2012) or relevant State or Territory Code of Practice.
- A copy of the (M)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 for the 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

- 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;
 - information becomes available on the sensitisation potential of the notified polymer;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from a component of industrial coatings, 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.

(Material) Safety Data Sheet

The (M)SDS of a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Evonik Australia Pty Ltd (ABN: 31 145 739 608)
Suites 33 & 37, 1 Ricketts Road
MOUNT WAVERLEY VIC 3149

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, 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, site of reformulation 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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in LA-D 1405/1404

MOLECULAR WEIGHT

> 1,000 Da

ANALYTICAL DATA

Reference NMR, IR, and GPC spectra were provided.

3. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Yellow liquid with characteristic odour*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	-35.5 °C	Estimated*
Boiling Point	151 °C at 101.3 kPa	Estimated*
Density	952 kg/m ³ at 25 °C	(M)SDS*
Vapour Pressure	0.51 kPa at 25 °C	Estimated
Water Solubility	$< 1 \times 10^{-9}$ g/L	Calculated by the notifier using EPI Suite 3.2 (US EPA, 2008); The water solubility is expected to be limited based on the hydrophobic structure of the notified polymer and its use in solvent.
Hydrolysis as a Function of pH	Not determined	Contains hydrolysable functionalities. However, significant hydrolysis is not expected as the notified polymer is expected to have limited solubility in water.
Partition Coefficient (n-octanol/water)	Log P_{ow} > 6 at 20 °C	Calculated by the notifier using EPI Suite 3.2 (US EPA, 2008); The

Adsorption/Desorption	Log K_{oc} = 8.7 at 20 °C	notified polymer is expected to partition from the aquatic phase to the octanol phase based on its potentially limited water solubility. Calculated using EPI Suite 3.2 (US EPA, 2008); The notified polymer is expected to adsorb to soil, sediment and sludge based on its high molecular weight and the presence of potentially cationic functional groups.
Dissociation Constant	pKa = 9.42	Estimated by the notifier; The notified polymer contains basic functionality with a typical pKa ~ 10 and is expected to be ionised under environmental conditions.
Particle Size	Not determined	Polymer is imported in solution
Flash Point	38 °C at 101.3 kPa	(M)SDS*
Autoignition Temperature	393 °C	Estimated for solvent in product
Explosive Properties	Not determined	Does not contain explosives
Oxidising Properties	Not determined	Not expected to have oxidising properties

*(M)SDS for product containing notified polymer at $\leq 75\%$ concentration.

Reactivity

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

Physical hazard classification

Based on the submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

4. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported in pre-formulated industrial coatings containing the notified polymer at $\leq 6\%$ concentration or in unformulated products containing the notified polymer at $\leq 80\%$ concentration.

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

Year	1	2	3	4	5
Tonnes	< 25	< 25	< 25	< 25	< 25

PORT OF ENTRY

Melbourne, Sydney, Brisbane, Perth and Hobart.

TRANSPORTATION AND PACKAGING

The notified polymer will be transported by road and/or rail. The notified polymer will be transported in the original import containers (25 kg steel drums or IBC).

USE

The notified polymer will be used as a component of a two-part industrial coating system. The notified polymer does not undergo any chemical change during the mixing of the two parts. It is anticipated that the industrial coatings will be applied to metal and concrete surfaces, in both indoor and outdoor industrial applications.

OPERATION DESCRIPTION

Imported products containing the notified polymer at $\leq 80\%$ concentration will be reformulated into industrial coatings in a closed system of drum-pumps with fixed transfer pipes and mixing machinery. The resulting coatings will contain the notified polymer at $\leq 6\%$ concentration. Similar industrial coatings will also be

imported, already formulated. The coatings will comprise one part of a two-part coating system. After mixing with the other part of the two-part system, the resulting formulation will be applied by brush, roller and spray in outdoor and indoor locations. Household application will not occur. Indoor spray application will be conducted within spray booths at industrial manufacturing facilities. Once applied and dried, the notified polymer will be contained as part of an inert matrix and will not be bioavailable.

5. HUMAN HEALTH IMPLICATIONS

5.1. Exposure Assessment

5.1.1. Occupational Exposure

CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport workers	2-3	10-15
Workers involved in reformulation	8	50
Laboratory workers	1	20
Workers involved in the application of coatings	6	260

EXPOSURE DETAILS

Transportation and Storage

It is expected that transport and warehouse workers (handling the imported solution containing $\leq 80\%$ notified polymer or formulated products containing $\leq 6\%$ notified polymer) will only be exposed to the notified polymer in the unlikely event of an accident.

Coating Formulation

At coating reformulation facilities, the processes are expected to be largely automated and enclosed, using drum-pumps and mixing machinery. Workers may be exposed to the notified polymer (at up to 80% concentration) during the transfer of the notified polymer from the shipping containers (25 kg steel drums or IBC), during sampling for quality control purposes and during cleaning and maintenance tasks. Exposure of workers to the notified polymer may occur via the dermal or ocular routes (inhalation exposure of workers to the notified polymer is not expected to occur during coating formulation processes). Personal protective equipment (PPE; including appropriate industrial clothing, eye protection and chemical resistant gloves) is expected to be worn during coating formulation processes to minimise exposure of workers to the notified polymer.

Coating Application

At end-use facilities, workers may be exposed to the notified polymer (at $\leq 6\%$ concentration), during transfer processes, mixing, application of the coatings and during cleaning and maintenance tasks. Exposure to the notified polymer is expected to be via the dermal and/or ocular routes. Inhalation exposure to the notified polymer is also possible during spray applications. Exposure to the notified polymer would be minimised through the use of PPE, including appropriate industrial clothing, eye protection and chemical resistant gloves (and respiratory protection during spray applications). Application may occur outdoors or indoors at industrial sites. In the latter scenario, spray application would occur within spray booths.

Once the coating is cured, the notified polymer is not expected to be bioavailable and further dermal contact should not lead to exposure.

5.1.2. Public Exposure

The products containing the notified polymer (at $\leq 80\%$ concentration) are intended for use in industrial settings only and will not be sold to the public. Therefore, the public may come into contact with these products only in the unlikely event of a transport accident. The public may come into contact with surfaces that have been coated with coatings containing the notified polymer. However, the notified polymer will be bound within the cured coating and will not be bioavailable.

5.2. Human Health Effects Assessment

No toxicological data were submitted.

Based on the high molecular weight (>1000 Da) of the notified polymer, the potential of the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed is limited (ECHA 2012). However, the polymer contains a proportion of low molecular weight species (<1000 Da) that may be absorbed. In addition, absorption across the respiratory tract is possible.

The notified polymer contains a functional group that has been associated with irritation/corrosion and belongs to a class of chemicals with concerns for skin and respiratory sensitisation. While the potential for these effects may be limited by the high molecular weight (and structure) of the polymer, sensitisation and/or irritant effects cannot be ruled out, particularly due to the presence of low molecular weight species.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

5.3. Human Health Risk Characterisation

5.3.1. Occupational Health and Safety

No toxicological data were provided for the notified polymer. However, sensitisation and/or irritant effects following exposure to the notified polymer, as imported ($\leq 80\%$ concentration) and in end-use products ($\leq 6\%$ concentration) cannot be ruled out. Therefore, steps should be taken to avoid exposure to the notified polymer.

Workers most at risk of exposure to the notified polymer (at $\leq 80\%$ concentration) include workers involved in formulation processes and workers involved in applying the coating products. Workers may experience dermal and ocular exposure to the notified polymer ($\leq 80\%$ concentration) during formulation processes and painting application. Inhalation exposure of workers to the notified polymer ($\leq 6\%$ concentration) may also occur during spray application. Therefore, spray application of coatings containing the notified polymer should take place in ventilated areas. In addition, the use of enclosed, automated processes should be implemented, where possible, and PPE (impervious gloves, goggles, coveralls and respiratory protection, if significant inhalation exposure is expected) should be worn by workers to minimise the potential for exposure to the notified polymer.

Therefore, provided that adequate control measures are in place to minimise worker exposure, including the use of automated processes and PPE, the risk to workers from the use of the notified polymer is not considered to be unreasonable.

5.3.2. Public Health

The notified polymer is intended for use in industrial applications by qualified operators. The public may come into contact with surfaces that have been coated with coatings containing the notified polymer; however, once cured, the notified polymer will not be bioavailable. Therefore, when used in the proposed manner, the risk to public health from exposure to the notified polymer is not considered to be unreasonable.

6. ENVIRONMENTAL IMPLICATIONS

6.1. Environmental Exposure & Fate Assessment

6.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will be imported as finished two-part coating products or will be imported as raw material for local reformulation into coating products. The reformulation of the notified polymer into final products will occur in a closed system of drum-pumps with fixed transfer pipes and mixing machinery. Therefore, no significant release of the notified polymer to the environment is expected during reformulation processes.

RELEASE OF CHEMICAL FROM USE

The coating products containing the notified polymer will be applied to metal and concrete surfaces by spray, brush and roller in a controlled manner for industrial applications only. The release of the notified polymer is expected to be negligible during its application by brush and rollers, considering the efficiency of these

techniques. Overspray from spray applications conducted indoors is expected to be contained by engineering controls in spray booths and collected for disposal. Overspray that occurs during outdoor spray applications is expected to be contained by the use of tarps. Drips will quickly dry, sealing the polymer into the paint matrix and making it unavailable to water or soil. Waste solid spray is expected to be recovered and disposed of to landfill in accordance with local regulations. It is estimated by the notifier that no more than 1% of total import volume of the notified polymer will be released to the environment during its use.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer will be cured into an inert matrix with other chemical substances as part of the coating process and hence will be immobilised within a polymeric film on coated articles. The notified polymer incorporated into the surface of the coated articles is expected to share the fate of the articles and be disposed of to landfill or subjected to metal reclamation. Residues in empty containers are expected to be either disposed of through drum recyclers or disposed of to landfill along with empty containers.

6.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer will be used for metal or concrete coating. It is expected to be cured into a solid polymeric matrix on the coated articles. The notified polymer is not expected to be mobile, bioavailable nor biodegradable in its cured form. The majority of the notified polymer is expected to be ultimately disposed of to landfill or thermally decomposed during metal reclamation. Bioaccumulation of the uncured polymer is unlikely due to its high molecular weight and limited potential for aquatic exposure based on the reported use pattern. 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.

6.1.3. Predicted Environmental Concentration (PEC)

The notified polymer is not expected to present at significant concentration in the aquatic environment because of the very low potential for direct release to surface waters when used in surface coatings. A Predicted Environmental Concentration (PEC) has therefore not been calculated.

6.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer contains functionalities that have the potential to be toxic to aquatic life. However, no significant exposure to aquatic organisms is expected based on the reported use pattern. Furthermore, the majority of the notified polymer will be cured with other chemical substances as part of the coating process and is not expected to be bioavailable.

6.2.1. Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) was not calculated as no ecotoxicological data for the notified polymer was submitted and there will be very low potential for aquatic exposure.

6.3. Environmental Risk Assessment

A Risk Quotient is unable to be quantified as a PEC and PNEC were not calculated. There is no significant aquatic release of the notified polymer anticipated based on its reported use pattern. Moreover, after curing, the majority of the imported quantity of the notified polymer will be incorporated into an inert matrix and is not expected to be mobile, bioavailable nor bioaccumulative. On the basis of the assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

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