File No: LTD/1703

May 2014

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in DISPERBYK-2070

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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

TABLE OF CONTENTS

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/1703	ResChem Technologies Pty Ltd; Jotun Australia Pty Ltd	Polymer in Disperbyk-2070	ND*	< 15 tonnes per annum	Component of 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

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
  - Avoid contact with skin and eyes

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
  - Coveralls
  - Gloves
  - Goggles

  Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the MSDS should be easily accessible to employees.

- 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.

- 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;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the polymer has changed from component of 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 the product containing the notified chemical 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

APPLICANTS
ResChem Technologies Pty Ltd (ABN: 90 315 656 219)
Suite 1103, 4 Daydream Street
WARRIEWOOD NSW 2102

Jotun Australia Pty Ltd (ABN: 29 007 126 696)
9 Cawley Road
BROOKLYN VIC 3025

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 manufacture/reformulation.

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
USA (2001)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Disperbyk-2070 (product containing the notified polymer)

OTHER NAME(S)
Disperbyk-2070 WS (product containing the notified polymer)

MOLECULAR WEIGHT
> 10,000 Da

ANALYTICAL DATA
Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
> 99%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Light yellow solid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	250-260 °C	(M)SDS*
Boiling Point	Not determined	-
Density	1000 kg/m^3 at 20 °C	(M)SDS*
Vapour Pressure	< 10^{-5} kPa at 25 °C (or 20 °C)	Estimated
Water Solubility	Not determined	Expected to be low due to the predominantly hydrophobic structure and

		the high molecular weight of the notified polymer
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionality. However, it is not expected to significantly hydrolyse under environmental conditions (pH 4 - 9).
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer is expected to partition from water to n-octanol on the basis of its low water solubility
Adsorption/Desorption	Not determined	Based on its cationicity and presumed low solubility in water, the notified polymer is expected to adsorb strongly to soil, sediment and sludge.
Dissociation Constant	Not determined	The notified polymer is a salt and is ionised at environmental pH (4-9).
Particle Size	Not determined	Polymer is imported in solution
Flash Point	> 100 °C at 101.3 kPa	(M)SDS*
Autoignition Temperature	Not determined	-
Explosive Properties	Not determined	Does not contain explosophores
Oxidising Properties	Not determined	Not expected to have oxidising properties from the structure

*(M)SDS for product containing notified polymer at ≤ 100% concentration.

DISCUSSION OF PROPERTIES

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.

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. The notified polymer will be imported by ship into Australia in two forms: as a component of a wetting and dispersing additive containing the notified polymer at 40-60% concentration and as a pre-formulated two-part surface coating containing the notified polymer at < 1% concentration.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	< 15	< 15	< 15	< 15	< 15

PORT OF ENTRY
Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS
Confidential

TRANSPORTATION AND PACKAGING
The notified polymer will be imported as 40-60% of a product, in sealed 25 kg or 200 kg drums.

The notified polymer will also be imported in a pre-formulated product at < 1% concentration in applicator tubes.

USE
A polymeric wetting and dispersing additive component of epoxy resins for coating applications involving wood, furniture coatings, automotive, marine and general industrial applications. Products for marine use will contain the notified polymer at < 1% concentration, whilst all other uses will use the notified polymer at < 5% concentration.

OPERATION DESCRIPTION
Imported products containing the notified polymer at 40-60% concentration will be reformulated using sealed vessels in bunded facilities to form paint coatings containing the notified polymer at < 5% concentration. Imported pre-formulated two-part surface coating products containing the notified polymer at < 1% concentration will not be modified prior to use by end-users.

The paint coatings will be manually stirred before application and will be applied by spray (40%), brush (10%) and roller (50%). Application by spray will be conducted in spray booths at industrial sites.

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 workers	2-3	10-15
Reformulation workers	8	50
Laboratory workers	1	20
End-users	6	260

EXPOSURE DETAILS

Transport and Storage workers
Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident. In such a case dermal and ocular exposure may be occur.

Local reformulation
The imported product containing the notified polymer at 40-60% concentration will be reformulated using sealed vessels in bunded facilities to form paint coatings containing the notified polymer at < 5% concentration. During the transfer of product to and from the mixing vessels, as well as during cleaning of the mixing vessels, reformulation workers may incur dermal and ocular exposure to the notified polymer.

The notifier stated that the exposure to reformulation workers will be minimised by the use of sealed vessels and the use of PPE including eye protection, coveralls, and gloves.

End-users applications
During applications by spray, workers may incur dermal and ocular exposure whilst mixing and loading products containing the notified polymer at < 5% concentration to spray guns, during spray application and when cleaning equipment.

During applications by brush and roller, workers may incur dermal and ocular exposure whilst manually decanting products containing the notified polymer at < 5% concentration, during manual application and when cleaning equipment.

The notifier stated that the exposure will be minimised by the use of eye protection, coveralls, and gloves. In addition, air respirators will be worn where necessary. All spray applications will be conducted within spray booths at industrial manufacturing facilities.

Once dry, the notified polymer will be immobilised within the polymer matrix and will not be available for exposure.

6.1.2. Public Exposure

The public may come into contact with surfaces treated with coatings containing the notified polymer, however once dry, the notified polymer will be immobilised within the polymer matrix and will not be available for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted. The high molecular weight and low level of low molecular weight species in the notified polymer would limit dermal absorption. The polymer is expected to be surface active and contains functional groups that may produce irritation, and the notifier has self-classified the notified polymer as a skin and eye irritant.

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).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

Although no toxicological data were provided for the notified polymer, based on the available information, the notified polymer may have irritation potential. Workers most at risk are those who are exposed to products containing the notified polymer at high concentrations.

Local reformulation

Reformulation workers may potentially be at risk of irritation when handling the imported products containing the notified polymer at 40-60% concentration. However, the risk is expected to be minimised by the use of sealed vessels for reformulation and the use of appropriate PPE including eye protection, coveralls, and gloves.

End-user application, including application by spray

End-users may potentially be at risk of skin and eye irritation when handling and applying the two-part surface coating products containing the notified polymer at < 5% concentration. However, the risk is expected to be minimised by the low concentration of the notified polymer present in these products and by the use of appropriate PPE including eye protection, coveralls, and gloves.

Inhalation exposure of workers to the notified polymer (< 5% concentration) may occur during spray application. Exposure and risk of irritation would be minimised by the use of spray booths, safe work practices and PPE (impervious gloves, goggles, coveralls and respiratory protection).

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

6.3.2. Public Health

The notified polymer is intended for use in industrial applications only. 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.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

No manufacturing of the notified polymer will take place in Australia. The notified polymer will be imported as a component of a 2-part surface coating and also as a wetting and dispersing additive for reformulation into coatings for wood, furniture, automotive, marine and general industrial applications. Environmental release of the notified polymer is unlikely to occur during importation, storage and transportation.

During the formulation process, an estimated 1% of the total importation volume of the notified polymer is expected to be lost due to spills. The spills are expected to be contained and collected for disposal to landfill. Up to 1% of the total import volume of the notified polymer is anticipated to remain in storage containers as residues. The residue in the storage containers will be cured prior to disposal to landfill. Manufacturing equipment will be rinsed with solvents. It is estimated that less than 1% of the total import volume of the notified polymer will be released to interceptor pits from cleaning of the equipment. The notified polymer is expected to be flocculated in the interceptor pits and to be removed before the treated effluent is released to the sewage treatment plants. The sludge containing the notified polymer is expected to be disposed of to landfill.

RELEASE OF CHEMICAL FROM USE

When coating formulations containing the notified polymer are applied by spray techniques, it is anticipated that between 20-30% of the coating products will form overspray and be collected as waste material. As the application of coating is expected to be conducted at industrial sites in designated spray booths, the overspray is expected to be captured in the spray booth filters or other capture systems. The captured notified polymer is expected to be disposed of to landfill. Application by brush and roller is expected to be efficient, with very little release expected from these application methods. Less than 1% of the notified polymer may remain as residues in the product containers, which are expected to be disposed of to landfill. It is estimated that up to 1% of the notified polymer, used in solvent-borne coatings, in washings of the application equipment is expected to be treated prior to be released to the sewer. In the wastewater treatment systems, the sludge containing the notified polymer is expected to be removed and disposed of to landfill.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer is expected to be disposed of to landfill along with the used article at the end of its useful life. The notified polymer is expected to remain associated with the substrate to which it has been applied.

7.1.2 Environmental fate

No environmental fate data were submitted. The captured overspray and the majority of articles to which the notified polymer will be applied will be disposed of to landfill. The majority of the notified polymer is expected to be cured within an inert polymer matrix adhering to articles following its use in coating applications. In its cured form it is not expected to be mobile, bioavailable or biodegradable. Ultimately, the notified polymer is expected to eventually degrade via biotic and abiotic processes in landfill, or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon, phosphorous and nitrogen.

A small fraction of the notified polymer may be released to the sewerage system due to the cleaning of the reformulation and application equipment. In wastewater treatment processes in sewage treatment plants (STPs), most of the notified polymer is expected to partition to sludge due to its low water solubility, high molecular weight and cationicity. The sludge from the STPs is expected to be removed for disposal to landfill or used on land for soil remediation. The notified polymer is not expected to bioaccumulate based on its high molecular weight.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) has not been calculated as release of the notified polymer to the aquatic environment will be very limited based on its reported use pattern.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer contains cationic groups and therefore may be toxic to algae. However, the notified polymer is expected to have low water solubility and very limited aquatic exposure is expected due to its use pattern.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has been not calculated for the notified polymer as no ecotoxicity data were submitted. The release of the notified polymer to the aquatic environment will be very limited based on its reported use pattern.

7.3. Environmental Risk Assessment

A risk quotient (PEC/PNEC) for the notified polymer was not calculated, as neither a PEC nor PNEC was derived. Release of the notified polymer to the aquatic environment in ecotoxicologically significant quantities is not expected based on its reported use pattern. The notified polymer is not expected to be bioaccumulative and is expected to slowly degrade in the environment. Based on the assessed use pattern of the notified polymer, it is not expected to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

Boethling, RS & Nabholz VJ (1997) Environmental Assessment of polymers under the U.S. Toxic Substances Control Act. In: Hamilton, JD Sutcliffe R ed. Ecological Assessment of Polymers Strategies for Product Stewardship and Regulatory Programs, 1st ed. New York, Van Nostrand Reinhold, pp 187-234.

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

SWA (2012) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/spray-painting-and-powder-coating.

SWA (2012) Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace, Safe Work Australia, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-risks-of-hazardous-chemicals-in-the-workplace.

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 >.