

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

MBS Polymer

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government Department of the Environment and Energy.

This Public Report is 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
PLC/1496	Henkel Australia Pty Limited	MBS Polymer	No	≤ 150 tonnes per annum	Component of industrial coatings

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- Water insoluble high molecular weight polymers in the respirable size range (< 10 µm) have the potential to cause lung overloading. Respiratory protection and engineering controls such as spray booths or local exhaust ventilation should be used if inhalation exposure may occur.

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* (Safe Work Australia, 2015) or relevant State or Territory Code of Practice.
- A copy of the 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 of 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

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency Procedures

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 polymer 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 polymer, 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria;
 - the notified polymer is introduced in powder form;

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from component of industrial coatings, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the notified polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the notified 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.

Safety Data Sheet

The SDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

Henkel Australia Pty Ltd (ABN 82 001 302 996)
135-141 Canterbury Rd
Kilsyth VIC 3137

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, polymer constituents, residual monomers/impurities, use details and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)

MBS Polymer

Molecular Weight

Number Average Molecular Weight (Mn) is > 10,000 g/mol

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20 °C and 101.3 kPa	Imported in dispersion in a semi-viscous liquid mixture
Melting Point/Glass Transition Temperature	-80 °C
Density	1,100 kg/m ³
Water Solubility	Insoluble
Particle Size	MV (mean diameter in microns of the “volume distribution”) = 91.4 nm cumulative 100% ≤ 171.9 nm cumulative 74.36% ≤ 102.2 nm cumulative 15.93% ≤ 72.3 nm
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Tonnes	5-150	5-150	5-150	5-150	5-150

Use

The notified polymer will be imported at < 50% to be reformulated in Australia into Part A of a two-part epoxy coating system. Part A containing the notified polymer will be mixed with Part B before the mixture containing the notified polymer is applied to metal components of moulded articles for industrial/automotive application, mainly by spray in industrial settings. Application by brush or roller may also occur.

6. HUMAN HEALTH RISK ASSESSMENT

The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard.

The notified polymer contains particles in the nano-size range, with approximately 74% < 100 nm and approximately 15% < 72 nm. The purpose of the polymer is to impart impact resistance to the epoxy resin, and is supplied dispersed in an epoxy solution. With the proposed form of introduction (dispersion), inhalation exposure to nano-size particles is not expected during handling and reformulation. As recommendations will be included to minimise worker exposure to the polymer during spray application of the finished coatings, inhalation of nano-size particles is not expected during this process. After application of coatings to the substrate and curing, the notified polymer will be trapped in the polymer matrix and will not be available for exposure.

The notified polymer is a high molecular weight ($> 10,000$ g/mol) polymer with low water solubility. Inhalation of polymers with molecular weights $> 70,000$ g/mol has been linked with irreversible lung damage due to lung overloading and impaired clearance of particles from the lung, particularly following repeated exposure (US EPA, 2017). While there is also a concern for polymers with molecular weights between 10,000 and 70,000 g/mol, it is acknowledged that there is a data gap for this range. Therefore, there is uncertainty for the potential for lung overloading effects with respect to the notified polymer. If the notified polymer is inhaled at low levels and/or infrequently, it is assumed that it will be cleared from the lungs. However, high level and/or frequent exposure may result in lung overloading effects, though the level of exposure in humans that would result in any effects, as well as the severity, is uncertain.

Exposure to the notified polymer during use will be minimised if appropriate workplace controls are in place when inhalation exposure may occur. The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment (Boethling & Nabholz, 1997).

The notified polymer will be imported as a component of a liquid epoxy product for local reformulation into Part A of a two-part epoxy coating system. Accidental spills of the notified polymer during import, transport, reformulation or storage are expected to be adsorbed onto suitable materials and collected for disposal of in accordance with local government regulations. Solvent waste containing the notified polymer from washing of reformulation equipment and empty import container will be recycled into subsequent batches when possible or be disposed of by an approved waste management facility in accordance with local government regulations.

The coatings containing the notified polymer will be mainly applied by spray to metal components of moulded articles of industrial/automotive application in industrial settings. Application by brush or roller may also occur. As estimated by the notifier, approximately 20% of the import volume of the notified polymer could be released as overspray during use. The overspray is expected to be collected and cured on spray booth filters before disposal to landfill in accordance with local government regulations. Solvent waste containing the notified polymer from washing of application equipment will be disposed of by an approved waste management facility in accordance with local government regulations.

The notifier estimated that up to 2% of the import volume of the notified polymer could remain as residues in empty end use containers. These wastes are expected to be collected for disposal to landfill in accordance with local government regulations.

Following the application, the notified polymer is expected to share the fate of the articles to which it has been applied, either subjected to metal reclamation processes or being disposed of to landfill at the end of their useful lives. During metal reclamation, the notified polymer will thermally decompose to form water vapour and oxides of carbon and nitrogen. In landfill, the notified polymer will be present as cured solids and will be neither bioavailable nor mobile. Thus, release of the notified polymer from the assessed use pattern is not expected to lead to ecotoxicologically significant concentrations in the aquatic environment. The notified polymer is not expected to bioaccumulate due to its high molecular weight and insolubility in water. The notified polymer in landfill is expected to eventually degrade via biotic and abiotic processes to form water and oxides of carbon and nitrogen.

Therefore, based on its assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the aquatic environment.

BIBLIOGRAPHY

Boethling, RS & Nabholz VJ (1997) Chapter 10 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.

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US EPA (2018) High Molecular Weight Polymers in the New Chemicals Program.
<https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/high-molecular-weight-polymers-new> Accessed 18 June 2018.