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

PUBLIC REPORT

Gohsefimer Z/WR

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:

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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 CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1675	M & A Trading Pty Ltd	Gohsefimer Z/WR	ND*	< 150 tonnes per annum	Component of coatings and adhesives

*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 as introduced:
 - Local exhaust ventilation
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced:
 - Avoid inhalation of dusts
- 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 as introduced:
 - Respiratory protection such as dust masks where dusts may be formed

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

- 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;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from a component of coatings and adhesives, 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 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)

M & A Trading Pty Ltd (ABN: 17 000 704 450)
Suite 134/438 Forest Road
HURSTVILLE NSW 2220

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, and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for all physico-chemical endpoints except for particle size.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Canada

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Gohsefimer Z-100

Gohsefimer WR

Gohsenx Z-100

Gohsenx WR

MOLECULAR WEIGHT

Number Average Molecular Weight (Mn) > 1,000 Da

ANALYTICAL DATA

Reference GPC and FTIR spectra were provided.

3. COMPOSITION

DEGREE OF PURITY > 94%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Off-white, light yellow granular powder

Property	Value	Data Source/Justification
Melting Point/Freezing Point	150-230 °C	(M)SDS
Density	1100-1400 kg/m ³	(M)SDS
Vapour Pressure	Not determined	Based on the high molecular weight of the notified polymer, the vapour pressure is expected to be low.
Water Solubility	Not determined	Expected to be dispersible based on its surface activity
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionalities. However, no significant hydrolysis is expected to occur under normal environmental conditions (pH 4-9).
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition to the interface between octanol and water, based on its surfactant properties
Adsorption/Desorption	Not determined	Expected to partition to phase boundaries based on its surfactant properties
Dissociation Constant	Not determined	Contains no dissociable functionality
Particle Size	Inhalable fraction (< 100 µm): 20 - 45% Respirable fraction (< 10 µm): Not determined	Measured
Flash Point	> 70 °C	(M)SDS
Flammability	Not determined	Not expected to be flammable based on flashpoint
Autoignition Temperature	440 °C	(M)SDS

Explosive Properties	Estimated	Contains no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties

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 be imported into Australia as a powder and will not be manufactured locally.

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>
<i>Tonnes</i>	< 150	< 150	< 150	< 150	< 150

PORT OF ENTRY

Melbourne and Sydney

IDENTITY OF RECIPIENTS

The notified polymer will be imported by M & A Trading Pty Ltd and will be distributed to end users.

TRANSPORTATION AND PACKAGING

The notified polymer will be imported into Australia by sea in 20 kg lined paper bags. The notified polymer will be transported between the dock and the notifier's warehouse facilities by road and stored until required by end users.

USE

The notified polymer will be used as an emulsifier for synthetic resins emulsions, including polyvinyl acetate (PVA) emulsion (90% of import volume). Polyvinyl acetate is a component of PVA wood glue and coatings. The notified polymer will be present in the final PVA formulation at a concentration of up to 5%. The PVA formulation will be mostly used for industrial applications, such as adhesive in furniture and construction materials. The glues may also be used by DIY consumers (9% of import volume).

The notified polymer will also be used as a coating agent for paper and films (10% of import volume), for non-food contact applications.

OPERATION DESCRIPTION

Resin Emulsions – Reformulation

The notified polymer will be dissolved in water with heating and agitation in a reactor. Monomers and initiator will then be added at a temperature of 60-75 °C and the resulting emulsion (containing the notified polymer at up to 5% concentration) will be transferred into various size and type of containers depending on customer requirements. These containers will range from 250 mL plastic squeeze bottles with applicator nozzle to 205 L drums.

Resin Emulsions – End user

In industrial applications, the resin emulsions containing the notified polymer at up to 5% concentration will be transferred into dispensing equipment (expected to usually be a low pressure tank fitted with a hose and applicator nozzle) and will be applied to substrate surfaces. Any excess material will be wiped off with a cloth or sponge.

Coating for paper and plastic film

The notified polymer will be dissolved in water in a blending tank with heat and agitation. Following cooling, the resulting solution will be mixed with other additives such as a cross-linker as required, and then applied on surfaces of papers or films using automated equipment. The surfaces will then be dried to obtain the final coated paper or film.

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	2-4	12
PVA emulsion manufacture	2-6	50
PVA emulsion end-use	50-200	260
Paper/film coating	8-20	260

EXPOSURE DETAILS

Transport and Storage

The notified polymer will be imported in 20 kg lined paper bags and transported from dock to notifier's warehouse facilities by road. Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident.

Resin Emulsions – Reformulation

The imported 20 kg lined paper bags containing the notified polymer will be opened by workers and the notified polymer added manually to a reactor. Inhalation, dermal and ocular exposure to the notified polymer at 100% concentration could occur. Workers are expected to wear coveralls, safety glasses, impervious gloves, and respiratory protection, and local ventilation is expected to be in place.

The remainder of the reformulation process will be fully automated and sealed.

Resin Emulsions – End user

Workers will decant the resin emulsions containing the notified polymer using pressurised (low pressure) pumping equipment into canisters. The canisters will be equipped with an applicator gun and used by workers, who will apply the resin emulsions to substrates. Excess resin emulsion will be cleaned using a cloth and equipment will be rinsed clean with water. Inhalation, dermal and ocular exposure to the notified polymer at 5% concentration could occur. Workers are expected to wear coveralls, safety glasses, and impervious gloves.

Coating for paper and plastic film

The imported 20 kg lined paper bags containing the notified polymer will be opened by workers and the notified polymer added manually to a blending tank. Inhalation, dermal and ocular exposure to the notified polymer at 100% concentration could occur. Workers are expected to wear coveralls, safety glasses, impervious gloves, and respiratory protection, and local ventilation is expected to be in place.

The remainder of the coating process will be automated and mostly enclosed. Once the coated paper/film leaves the coating equipment, the coating will be cured and dried and the notified polymer will not be available for exposure.

6.1.2. Public Exposure

The finished glue products containing the notified polymer at up to 5% concentration will be available to the general public. The glues will be sold in consumer containers (e.g. plastic squeeze bottles fitted with an applicator nozzle). Dermal exposure of the hands will be the most probable route of exposure. The product labelling will contain recommendations for the use of impervious gloves. Once the glues are dry the notified polymer will be trapped within the glue matrix and is not expected to be available for exposure.

When the notified polymer is used for film coating application the notified polymer will be in a cured coating on the surface of the film and based on its high molecular weight is not expected to be available for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

The notified polymer is not expected to be absorbed across biological membranes to a significant extent based on its high molecular weight ($M_n > 1,000$ Da) and low level ($< 1\%$) of low molecular weight species (< 1000 Da). Hence systemic toxicity is not expected. Furthermore, the notified polymer does not contain any structural alerts of concern.

The physical form of the notified polymer as imported at 100% concentration may represent a dust hazard. The particle size of the notified polymer indicates that a small portion may be respirable ($< 10 \mu m$). The notified polymer is water soluble and therefore if inhaled at low levels is likely to be cleared from the upper respiratory tract readily through mucociliary action. Small proportions of the notified polymer may reach the lower respiratory tract, but it should still be readily cleared from the lungs unless high levels are inhaled. When high concentrations of the notified polymer are inhaled, it is likely to be cleared from the lungs, but this may be slower and temporary respiratory impairment is possible.

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

The main risk posed by the notified polymer is the potential to cause temporary lung overloading effects when high concentrations of the notified polymer are inhaled.

Workers most at risk of temporary lung overloading effects will be workers handling the powdered notified polymer as introduced. The expected use of respiratory protection such as dust masks and local exhaust ventilation when handling the powdered notified polymer by workers should reduce inhalation exposure levels and hence lower the risk.

Therefore, provided control measures are in place to reduce inhalation exposure, the risk to the health of workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The public may be dermally exposed to the notified polymer at up to 5% concentration when applying glues containing the notified polymer. However, based on the low concentration and assumed low hazard of the notified polymer, the risk to the health of the public 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. However, the notified polymer will be used in reformulation of resin emulsions within Australia. Accidental spills of the notified polymer (2% of the total import volume) and the residues of the notified polymer in empty containers (2% of the total import volume) along with the empty containers are expected to be disposed of to landfill. Release of the notified polymer (up to 3% of the total import volume) during polyvinyl acetate (PVA) emulsion manufacture is expected from rinsing tanks and transfer lines. The rinsate is expected to be reused; however, a small proportion is likely to be released to on-site waste water treatment plants.

RELEASE OF CHEMICAL FROM USE

The notified polymer (81% of the total import volume) in PVA adhesive is expected to be applied in an industrial setting to articles in an enclosed and automated system. Once cured, the resin will form a solid inert matrix. The notified polymer in PVA adhesive is expected to be used as wood glue by retail consumers (9% of the total import volume). Up to 5% of the annual import volume of notified polymer is expected to be released to sewer as waste collected from the cleaning of manufacturing equipment and the residue remaining in empty import containers.

The notified polymer (up to 10% of the total import volume) is also used as a coating agent for papers (e.g. thermal recording paper) and films. During the use as paper and film coating, releases of the notified polymer may occur from cleaning of application equipment and in the form of residues in empty containers (up to 2% of the total import volume). The wash water generated from the cleaning of equipment is expected to be collected and disposed of to on-site waste water treatment plants.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer will be applied to the surfaces of articles as adhesive and coatings and will share the fate of the articles. At the end of their useful life most of the articles will be sent to landfill. Approximately 50% of the waste papers are likely to be sent to recycling facilities. At the end of their useful life, the metal articles coated in adhesive containing the notified polymer are expected to be sent to metal reclamation facilities. The occurrence of some release of uncured notified polymer to sewer may occur.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be disposed of to landfill as waste from residues in empty import containers, and articles at the end of their useful life. The adhesive containing the notified polymer will cross-link to form a solid inert resin matrix. Once cured, the notified polymer is physically bound into the resin matrix and is not expected to be mobile or bioavailable.

During paper recycling processes, it is assumed that 50% of the waste paper to which the notified polymer is applied will end up in landfill and the rest will undergo paper recycling processes. During paper recycling processes, waste paper is repulped using a variety of chemical agents, which, amongst other things, enhance detachment of inks and coatings from the fibres. The coating containing the notified polymer is expected to partition to sludge due to its surfactant properties, and subsequently be disposed of to landfill. The notified polymer will eventually degrade biotically or abiotically in landfill to generate water and oxides of carbon.

Discarded end-use metal articles containing the notified polymer in PVA adhesive will be recycled for metal reclamation which will entail thermal decomposition of the PVA adhesive to form oxides of carbon and water.

The release of the notified polymer to the aquatic environment is not expected to be significant based on its assessed use pattern. Although the notified polymer is dispersible in water column, it is expected to partition to phase boundaries based on its surfactant properties. In the event of release to sewer, the notified polymer is expected to be removed from the water column by sorption to sediment and sludge. The notified polymer will eventually degrade biotically or abiotically in sediment and sludge to generate water and oxides of carbon. As its molecular weight is > 1000 Da, it is not expected to cross biological membranes and, therefore, it is not likely to bioaccumulate.

7.1.3. Predicted Environmental Concentration (PEC)

The PEC for the notified polymer has not been calculated since no significant release to the environment is expected based on its reported use pattern.

7.2. Environmental Effects Assessment

No ecotoxicity data for the notified polymer or any acceptable analogue polymer were submitted. High molecular weight non-ionic polymers are a class of substances that are generally assumed to be of low environmental concern.

7.2.1. Predicted No-Effect Concentration (PNEC)

The PNEC has not been calculated since no ecotoxicity data are available for the notified polymer.

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) for the notified polymer has not been calculated as the notified polymer is unlikely to result in ecotoxicologically significant concentrations in the aquatic environment. The majority of

the notified polymer will be disposed of to landfill as cured adhesive or coated articles. The notified polymer in adhesive is physically bound into a solid inert resin matrix, and is unlikely to be bioavailable or leach in this form. On this basis, the notified polymer is not expected to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

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

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>.

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