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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in Morez 400

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FULL PUBLIC REPORT**Polymer in Morez 400****1. APPLICANT**

Rohm and Haas Australia Pty Ltd of 969 Burke Road CAMBERWELL VIC 3124 (ABN 29 004 513 188) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) Polymer in Morez 400.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Marketing names: Polymer in Morez 400

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition and purity have been exempted from publication in the Full Public Report.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	Clear, odourless solid granule	
Melting point	not determined	
Density	1.1 kg/m ³	
Water solubility	19 ppm	(see comments below)
Particle size	3 – 4 mm diameter	non-respirable

Flammability	not determined	not expected to be flammable
Autoignition temperature	not determined	not expected to self ignite
Explosive properties:	not determined	none known
Hydrolysis as a function of pH:	not determined	(see comments below)
Adsorption/desorption:	not determined	(see comments below)
Dissociation constant:	not determined	(see comments below)
Stability/reactivity	not determined	stable under normal conditions of use; has low potential for reactivity

5.1 Comments on physical and chemical properties

The water solubility was tested according to OECD TG 105, by adding approximately 0.5 g of the polymer to 50 mL double filtered deionised water and shaking the flasks for 24 h. The samples were then allowed to equilibrate for 24 h before being filtered and dried to determine total dissolved solids. Triplicates were analysed and the average value reported.

Hydrolysis of the ester linkages of the polymer is possible but would not be expected under environmental conditions (pH 4-9).

On the basis of the low water solubility, the polymer is likely to have a high log P, and adsorb to or associate with soil/sediment and organic matter and be immobile in soil.

The polymer contains carboxylic acid groups which are intended to react with alkali to form a water soluble polymer salt. In this form the polymer would be more soluble and mobile in soil.

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer will be used as a binder for aqueous flexographic printing inks used for printing of paper and cardboard packaging materials.

Manufacture/Import volume:

The estimated quantity of the notified polymer to be imported is approximately 10 tonnes in the first year, increasing to 50 tonnes per annum in the next 4 years.

Formulation details:

The notified polymer will be imported into Australia as a component of Morez 400 at concentrations >90%, as a solid granule (approximately 3-4 mm diameter) in 23 kg paper bag. Morez 400 will be sold to printing ink manufacturers for formulation into printing inks.

Finished printing inks are gravity fed or pumped into 1000L IBC containers, 200L drums or 20 L pails. Finished ink products containing 10-15% w/w notified polymer are sold to printers for printing on corrugated cardboard boxes for packaging applications.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
Formulation		
<i>Ink Makers (10-15 workers, 6-8 hr/day, 50 days/year)</i>		
dermal and inhalation	exposure to solid polymer (>90% w/w notified polymer) while loading bags into the mixing vessel	impervious gloves, coveralls, safety boots and safety glasses; ink mixing vessels are fitted with local exhaust ventilation
dermal and ocular	exposure to liquid spills and drips when connecting and disconnecting transfer hoses, during transfer of printing inks into containers for packaging, and when cleaning spills and equipment (maximum 15% w/w notified polymer)	impervious gloves, coveralls, safety boots and safety glasses
<i>Ink Technicians (5-15 workers, 0.5 hr/day, 50 days/year)</i>		
dermal and ocular	exposure to small quantities when collecting samples and performing QC testing of liquid inks (maximum 15% w/w notified polymer)	impervious gloves, coveralls, safety boots and safety glasses
End use		
<i>Printers (30-40 workers, 7 hr/day, 150 days/year)</i>		
dermal and ocular	liquid ink is transferred from supplied container to printing press ink trays by either pumping or manual transfer from pails; exposure to spills and drips when loading ink trays and cleaning of printing presses (maximum 15% w/w notified polymer)	impervious gloves, coveralls, safety boots and safety glasses; local exhaust ventilation above printing presses
<i>Transport and Storage workers (10-15 workers)</i>		

dermal no exposure is expected as the notified polymer will only be handled in sealed containers, except in case of an accident none

8. PUBLIC EXPOSURE

The notified polymer and the products containing it are not available for sale to the public.

The potential for public exposure to the notified polymer during transport, reformulation or disposal is likely to be negligible. Although the public will make dermal contact with dried form of the notified polymer when handling cardboard packaging materials printed with ink containing the notified polymer, public exposure is expected to be low.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

Storage sites

The notified polymer in Morez 400 will be stored in banded warehouses at the transport depot and customer sites. In the event of a spill, the solid polymer granules will be taken up by shovel and disposed of to a licensed waste landfill site.

Ink Manufacturing

There is potential for spillage of the notified polymer during formulation. The solid polymer will be swept up and re-used if not contaminated, otherwise it would be taken off-site to a licensed waste landfill site. It is estimated that 0.5 % per annum per site will be lost in this manner. Based on 50 tonnes/annum imported and delivered to 4 manufacturer sites, this equates to approximately 1000 kg of notified polymer. Spillage of inks will be taken up by absorbent material and disposed of to landfill. The approximate amount of printing ink lost per annum is 333 kg or 50 kg of notified polymer.

Wash water from formulation equipment will be re-used in subsequent batches of ink where possible. Otherwise, it will be treated on-site or sent off-site to a licensed waste disposal contractor. During treatment on-site or by contractor, it is estimated that >90 % of the notified polymer will be precipitated in treatment plant sludge and disposed to landfill. The remaining <10 % in the supernatant water will be released to the sewer. It is estimated that 0.5 % of manufactured ink is lost to wash water which equates to 225 kg disposed of to landfill and 25 kg to the sewer.

An estimated 110 kg of the notified polymer will be lost to landfill as residue in the empty import bags.

Printing of Packaging

Any ink spills will be taken up by absorbent material and disposed of to licensed waste landfill site. It is estimated that approximately 333 kg of ink or 50 kg of polymer will be lost in this manner.

Up to 0.5 % of the printing ink will remain as residues in the transport containers. This equates to approximately 250 kg of the polymer in drums and pails, with disposal to either licensed drum reconditioner or landfill. The empty bulk containers will be returned to the ink manufacturer for reuse, with wash water disposed of as described above.

Unused ink from the printing process will be reused and ink residues for the printing presses will be wiped off with rags or paper towelling and disposed of to a licensed waste landfill site. It is estimated that approximately 1 kg of ink residue will remain on the presses at the end of a day's shift. Based on 150 days usage per site, and 20 printing sites, approximately 3000 kg of ink will need to be disposed of (450 kg of the notified polymer).

Disposal of packaging

The ultimate fate of packaging material will be recycling, incineration or landfill. The majority is expected to be recycled where more than 90 % of the notified polymer is expected to be precipitated in waste treatment sludge and disposed of to landfill.

9.2. Fate

The majority of the notified polymer from spills, cleaning, wash water and recycling of packaging will go to landfill. Within landfill the polymer is expected to be immobile due to low water solubility in the acid form and will become part of the soil matrix due to its polyanionic nature. In the salt form, as found in alkaline printing inks, the polymer is very soluble and therefore would be expected to be more mobile with the potential to leach. Increased solubility would also occur if the polymer encountered alkaline soils or water.

Polymer in the acid form accidentally entering waterways would be expected to associate with the sediments. Polymer in the salt form would be expected to dilute and disperse and eventually partition to sediment due to its polyanionic nature. The notified polymer is not expected to cross biological membranes due to its high molecular weight and is not expected to bioaccumulate.

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

The health hazards of the constituents and hazardous impurities, additives and adjuvants are tabulated below.

Chemical	Health hazards	Regulatory controls
Constituents	no residual monomers are present at and above the relevant cut-offs for the notified polymer to be classified as a hazardous substance	
Hazardous impurities	none present	
Additives/adjuvants Dipropylene glycol, monomethyl ether	primary irritant (RTECS, 2000); potential for skin absorption (NOHSC, 1995)	150 ppm STEL, 100 ppm TWA and skin notation (NOHSC, 1995)

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were submitted.

12. ENVIRONMENTAL RISK ASSESSMENT

The notified polymer has low water solubility and any disposed of to landfill prior to formulation is expected to be immobile and associate with the soil matrix due to its polyanionic nature. During formulation the polymer is reacted with alkali and forms an ammonium salt which is highly dispersible in water. In this form, such as in ink residues, the polymer is expected to be more mobile in landfill. However, environmental exposure in this manner should be low and dispersed. Therefore, the overall environmental hazard should be low.

The majority of the notified polymer will be disposed of by the recycling of packaging, and will be disposed of in the waste sludge from the recycling process. Packaging disposed of directly to landfill will slowly degrade and the polymer will associate with the soil matrix.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information has been provided for the notified polymer. However, the notified polymer meets the PLC criteria and is unlikely to be a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

The notified polymer has high molecular weight and is not expected to cross biological membranes.

The notified polymer contains low residual levels of dipropylene glycol monomethyl ether, which has NOHSC exposure standards of 150 ppm STEL and 100 ppm TWA with potential for skin absorption.

The Material Safety Data Sheet (MSDS) indicates that health effects such as irritation to the mouth, throat and stomach following ingestion, mechanical irritation in the eye and skin drying and irritation may occur on repeated or prolonged contact with skin.

13.2. Occupational health and safety

There is no occupational exposure expected for truck drivers and storage workers except in case of an accident.

During formulation and end use, the major route of exposure for the notified polymer is dermal. Dermal exposure to solid polymer granules (approximately >90% notified polymer) can occur when emptying bags containing the notified polymer into the mixing vessel. Inhalation of dust is possible. The polymer is not volatile and in solid granular form has a potential for inhalation and dermal exposure.

Dermal contact with printing ink from drips and spills is possible while packaging of printing inks and cleaning spills and equipment, loading printing ink into ink trays and cleaning of printing presses. Eye exposure is also possible when splashing occurs. The printing ink contains notified polymer to a maximum of 15%. Therefore, occupational exposure to the notified polymer can occur but is expected to be low.

During the above activities, workers wear skin and eye protection. Ink mixing vessels and printing presses are fitted with local exhaust ventilation.

The notified polymer contains low levels of dipropylene glycol monomethyl ether, which may be absorbed through the skin. Therefore, precautions should be taken to minimise exposure.

Conclusion

The notified polymer is not hazardous to human health and measures are in place to control occupational exposure. Therefore, the notified polymer is of low concern to occupational health and safety and no specific risk reduction measures are necessary.

13.3. Public health

The notified polymer and the products containing it are not available for sale to the public. Dermal contact with the dried form of the notified polymer is limited to handling cardboard packaging materials printed with ink containing the notified polymer. The dried form of the notified polymer printed on cardboard packaging is unlikely to be bioavailable. Therefore, the risk to public health from the notified polymer is low.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

No specific precautions are required to control exposure to the notified polymer. However, in the interests of good occupational health and safety, the following guidelines and precautions should be observed:

- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves should be used during occupational use;
- Spillage of the notified chemical should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- A copy of the MSDS should be easily accessible to employees.

There is a NOHSC exposure standard for dipropylene glycol monomethyl ether of 150 ppm STEL and 100 ppm TWA with skin absorption notation. Employers are responsible for ensuring that this level is not exceeded in the workplace.

If products containing the notified chemical are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b), workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Guidance in selection of protective eyewear may be obtained from Australian Standard (AS) 1336 (Standards Australia, 1994) and Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); for industrial clothing, guidance may be found in AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161.2 (Standards Australia/ Standards New Zealand, 1998); for occupational footwear, in AS/NZS 2210 (Standards Australia/ Standards New Zealand, 1994a); for respirators, in AS/NZS 1715 (Standards Australia/ Standards New Zealand, 1994b) and AS/NZS 1716 (Standards Australia/ Standards New Zealand, 1994c); or other internationally acceptable standards.

16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

- (i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of the notified polymer becomes aware of any of these circumstances, they must notify the Director within 28 days; or
- (ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

17. REFERENCES

National Institute of Occupational Safety and Health (2000) Registry of Toxic Effects of Chemical Substances.

National Occupational Health and Safety Commission (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. Australian Government Publishing Service, Canberra.

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

National Occupational Health and Safety Commission (1995) Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NOHSC:1003(1995)]. In: Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]. Australian Government Publishing Service, Canberra.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Standards Association of Australia.

Standards Australia (1994) Australian Standard 1336-1994, Eye protection in the Industrial Environment. Standards Association of Australia.

Standards Australia/Standards New Zealand (1992) Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994a) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994b) Australian/New Zealand Standard 1715-1994, Use and Maintenance of Respiratory Protective Devices. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994c) Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand.