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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in Lamal HSA Slip

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FULL PUBLIC REPORT**Polymer in Lamal HSA Slip****1. APPLICANT**

Rohm and Haas Australia Pty Ltd of Floor, 969 Burke Road Camberwell VIC 3124 (ACN 004 513 188) and Coates Australia Pty Ltd of 323 Chisholm Road Auburn NSW 2144 (ACN 000 079 550) have submitted a limited notification statement in support of their application for an assessment certificate for Polymer in Lamal HSA Slip.

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 and the Summary Report.

Marketing Name: Lamal HSA Slip (containing a high proportion of notified polymer).

3. PHYSICAL AND CHEMICAL PROPERTIES

The following physico-chemical data are from Lamal HSA Slip polymer solution, unless otherwise stated.

Appearance at 20°C & 101.3 kPa:	clear to yellowish viscous liquid
Boiling Point:	78°C (ethanol)
Specific Gravity:	0.98
Vapour Pressure:	the notified polymer is not volatile
Water Solubility:	49 mg/L
Partition Co-efficient (n-octanol/water):	not determined (see comments below)
Hydrolysis as a Function of pH:	the polymer linkages may undergo hydrolysis under extreme temperature and pH
Adsorption/Desorption:	not determined (see comments below)

Dissociation Constant:	pK _a =10.7 - 11 (estimated).
Particle Size:	not applicable as the notified polymer is only used in solution
Flash Point:	12.2°C (closed cup)
Autoignition Temperature:	not determined
Explosive Properties:	not explosive
Reactivity/Stability:	stable under normal environmental conditions

3.1 Comments on Physico-Chemical Properties

Water solubility was determined according to OECD 105 as 49 mg/L (Ruffin, 2000). This indicates that the chemical is moderately soluble. The notifier stated that they expected the water solubility of the notified polymer to be insignificant. However, the presence of terminal amine groups would increase the water solubility from that expected for a polymer of high molecular weight and a high proportion of hydrophobic functional groups.

The notified polymer contains linkages that may undergo hydrolysis, but this is unlikely in the environmental pH range 4-9.

The partition coefficient has not been determined in consideration of its likely hydrophobic nature.

The adsorption/desorption was not determined, but the notifier has indicated that the polymer is expected to be immobile in soil due to its composition and high molecular weight.

The low content of amine groups have the potential to dissociate as they are expected to have typical basicity.

The polymer is expected to remain stable under ambient conditions. The notified polymer is designed to cross-link with other polymers via the hydroxyl groups present

4. PURITY OF THE CHEMICAL

Degree of Purity: high

Additives/Adjuvants:

<i>Chemical name:</i>	ethanol
<i>Synonyms:</i>	ethyl alcohol
<i>CAS No.:</i>	64-17-5

Weight percentage: confidential

Toxic properties: eye irritant, vapours irritate eyes and respiratory tract (American Conference of Government Industrial Hygienists, 1998)
NOHSC exposure standard 1000 mg/m³ TWA (NOHSC, 1995)

Chemical name: isopropanol

Synonyms: isopropyl alcohol

CAS No.: 67-63-0

Weight percentage: confidential

Toxic properties: eye irritant, vapours irritate eyes and respiratory tract (American Conference of Government Industrial Hygienists, 1998)
NOHSC exposure standard 400 mg/m³ TWA 500 mg/m³ STEL (NOHSC, 1995)

5. USE, VOLUME AND FORMULATION

The notified polymer is used as one component of a two pack laminating adhesive for plastic and/or aluminium films used to package dry food and confectionery.

The notified polymer will not be manufactured in Australia, but will be imported as a component in the product, Lamal HSA Slip. The estimated import quantity of the notified polymer is approximately 30 tonnes in the first year increasing to 60 tonnes per annum in 5 years.

Lamal HSA Slip is an ethanol solution containing a high proportion of notified polymer. This will be reformulated in Australia to produce an adhesive which is predominantly Lamal HSA Slip with an epoxy resin additive. Lamal HSA Slip will be imported in 200 L steel drums and 20 L steel pails.

6. OCCUPATIONAL EXPOSURE

Transport and storage

The notifier estimated that 5 waterside workers and 15-20 transport drivers and warehouse workers will be involved in the transport and storage of the product containing the notified polymer. These workers could be exposed to the notified chemical only in the event of an accident where the packaging is breached.

Laminating machine operator

At the laminating site, Lamal HSA Slip is either decanted from 20 L pails or transferred by gravity from 200 L drums into a mixing vessel of 50-100 L capacity. It will be mixed with another component of the adhesive system in the mixing vessel mechanically for 15 minutes. The blended adhesive containing > 50 % notified polymer is either manually transferred to

the laminating machine adhesive tray (for quantities less than 20 L) or pumped mechanically from the mixing vessel to a holding vessel (about 20 L) of the laminating machine and further pumped to an adhesive tray. The blended adhesive is applied by the gravure coating process where two polymers and/or aluminium film are laminated together with the adhesive between the films. Following completion of a run, unused adhesive in the laminating machine tray or reservoir is transferred to a waste drum manually. The adhesive residues on the machinery are washed off manually using rags and ethanol.

There will be 10-20 laminating machine operators who may be exposed to the product containing the notified polymer and the blended adhesive. The maximum potential exposure for laminating machine operators is estimated to be 6-8 hours per day, 50 days per year. The main routes for occupational exposure to the polymer will occur through skin and eye contact. Laminating machinery operators wear safety glasses, impervious gloves, overalls and safety boots during blending of the adhesive, transfer of the adhesive to laminating machines, and cleaning of the machines. Blending vessels are situated in a bunded area with local exhaust ventilation, while laminating machinery is either fitted with exhaust ventilation ducts above the adhesive tray or in a wall or ceiling adjacent to the machinery.

There is little potential for exposure to the notified polymer after it has been incorporated in packaging materials, because it will be sandwiched between two impervious layers and also crosslinked and not separately available for exposure.

7. PUBLIC EXPOSURE

The notified polymer is not available for sale to the general public and will be used as an ingredient in laminating adhesive products for use in food packaging applications. The potential for public exposure to the notified polymer during transport, reformulation or disposal is assessed as extremely low. There is little potential for exposure of the general public to the notified polymer in packaging materials, because it will be sandwiched between two impervious layers and also crosslinked and not separately available for exposure.

8. ENVIRONMENTAL EXPOSURE

8.1 Release

The notifier has estimated the following amounts of the polymer solutions may be lost from the sources specified as a result of the formation and use of the adhesive:

Spills:	approximately 68 kg per annum
Residues in the import containers:	approximately 204 kg per annum
Equipment cleaning:	approximately 170 kg per annum
Unused blend:	less than 408 kg per annum

The total amount of notified polymer that may be wasted during its use is likely to be less than 850 kg/year when 60 tonnes of Lamal HSA Slip are imported.

It is likely that the spilt Lamal HSA Slip (containing the notified polymer) and the associated clean-up materials will be disposed of to landfill.

The blending and laminating equipment will be cleaned daily with rags and solvents, which will be collected in the empty importation drums, along with any unused blended adhesive. The drums will then be collected by licensed waste contractors for disposal. The waste solvent and any liquid adhesive and Lamal HSA Slip will be incinerated. The empty drums and any solid Lamal HSA Slip or adhesive will then be disposed of to landfill.

The majority (98.6 %) of the notified polymer will be incorporated into dry food and confectionery packaging.

8.2 Fate

Notified polymer spilt or wasted during the formulation process will be disposed to landfill by licensed hazardous waste contractors in the 200 L importation drums. If any leakage were to occur from the importation drums the notified polymer is likely to associate with the soil and not leach into the aquatic environment.

The majority of the notified polymer will be incorporated in dry food and confectionery packaging, and ultimately make its way into domestic landfill as household garbage. The packaging material will not degrade readily but will ultimately degrade due to chemical and biological actions. Degradation products are likely to associate with the soil and not leach out by water.

The polymer is not expected to cross biological membranes, due to its high molecular weight, and should not bioaccumulate (Connell, 1990).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data were submitted. Polymers of low reactivity and high molecular weight do not readily cross skin or other biological membranes, and the toxicity of the notified polymer is therefore expected to be low.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicity data were submitted.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Minimal release to the aquatic environment is expected during the use of the notified polymer in the formulation of the laminated adhesive. Small quantities of the notified polymer derived from spills and residue waste will ultimately be released to landfill. In landfill, the polymer is unlikely to be mobile in the soil environment and would be expected to slowly degrade to carbon dioxide and other gases through abiotic and biotic processes. The environmental hazard of the notified polymer in landfill is expected to be low. If incinerated, the polymer would be rapidly destroyed and converted to water vapour and oxides of carbon and nitrogen.

Release to the aquatic environment is expected through the disposal of food packaging to domestic landfill but this will be minimal. As the packaging gradually degrades the resulting end polymer is likely to associate with the soil, where it is unlikely to be leached out.

The Material Safety Data Sheet (MSDS) has outlined the correct procedure to be followed if the material is accidentally released onto soils or into waterways.

The high molecular weight of the notified polymer should prevent bioaccumulation. The overall environmental hazard is therefore expected to be low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

No toxicological information has been provided for the notified polymer and therefore the substance cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999). Since the notified polymer has high NAMW, absorption across biological membranes would be restricted.

The MSDS for Lamal HSA Slip lists a number of potential health effects, namely irritating to eyes, mouth, throat, gastrointestinal tract and respiratory system, nausea, vomiting, dizziness, drying of skin, and anaesthetic and narcotic effects. These relate mainly to the other components in the product rather than the notified polymer.

Lamal HSA Slip is a Class 3 Dangerous Good (flammable liquid) due to the solvent content.

Occupational health and safety

There is little potential for significant health risk to the notified polymer in the transport and storage of the product containing this polymer.

Potential exposure to the polymer in Lamal HSA Slip will be during the blending and transfer of adhesives, particularly manual transfer, and when cleaning equipment. Exposure to the notified polymer *via* inhalation is expected to be minimal due to its low volatility. Exposure is most likely to be by skin contact. However, laminating machine operators are instructed to wear safety glasses, impervious gloves, overalls and safety boots when handling Lamal HSA Slip and the blended adhesives. In addition, blending vessels are situated in a bunded area with local exhaust ventilation. Laminating machinery is either fitted with exhaust ventilation ducts above the adhesive tray, or in a wall or ceiling adjacent to the machinery. The health risk for laminating machine operators posed by the notified polymer is considered to be low.

The notified polymer becomes unavailable for absorption once it is incorporated in the laminated material. The health risk for workers in the food packaging industry, and in the distribution and retailing snack food is considered to be negligible.

The notified polymer has been used commercially in Europe and the USA for a number of years. No adverse health effects arising from human exposure to the notified polymer have been observed or reported.

Public health

The notified polymer is not available for sale to the general public and will be used in

lamine adhesive products for use in food and other packaging applications. Although members of the public may consume food from laminated packages manufactured using the notified polymer, the risk to public health from the notified polymer is likely to be low because the notified polymer is sandwiched between two impermeable layers and is unlikely to be bioavailable.

13. RECOMMENDATIONS

To minimise occupational exposure to Polymer in Lamal HSA Slip the following guidelines and precautions should be observed:

- Employers should ensure that NOHSC exposure standards for all components of the blended adhesive are not exceeded in the workplace;
- Safety goggles, chemical resistant industrial clothing and footwear and impermeable gloves should be used while handling the product containing the notified polymer; where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used;
- 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.

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

Guidance in selection of goggles 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 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161 (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).

14. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical was provided in a format consistent with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, the director must be informed if any of the circumstances stipulated under subsection 64(2) of the Act arise, and secondary notification of the notified chemical may be required. No other specific conditions are prescribed.

16. REFERENCES

American Conference of Government Industrial Hygienists (1998). TLVs and Other Occupational Exposure Values.

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

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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.