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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Baysynthol VP SP 42010 WST FKP

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

Baysynthol VP SP 42010 WST FKP

1. APPLICANT

Bayer Australia Ltd, Speciality Products Business Group of 633-647 Springvale Road, MULGRAVE NORTH VIC 3170 has submitted a Polymer of Low Concern notification statement in support of their application for an assessment certificate for Baysynthol VP SP 42010 WST FKP.

2. IDENTITY OF THE CHEMICAL

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

Marketing Name:	Baysynthol VP SP 42010 WST FKP
Other Names:	Barsynthol VP SP 42010

Characterisation as a Synthetic Polymer of Low Concern

Number-Average Molecular Weight (NAMW):	> 1 000
Weight-Average Molecular Weight:	> 50 000
Polydispersity:	> 2.00
Maximum Percentage of Low Molecular Weight Species	
Molecular Weight < 500:	< 10 %
Molecular Weight < 1 000:	< 25 %
Polymer Stability	expected to be stable under normal environmental conditions
Reactivity	no reactive functional groups are present; the polymer contains low concern cyclic hydroxyl and keto groups

Charge Density	no charged functional groups or functional groups which would be expected to become charged under normal environmental conditions are present

The polymer meets the criteria for assessment as a synthetic polymer of low concern under Regulation 4A of the *Industrial Chemicals (Notification and Assessment) Act 1989*(the Act).

3. PHYSICAL AND CHEMICAL PROPERTIES

The physical and chemical properties given below are for the product containing the notified polymer, Baysynthol AGP.

Appearance at 20°C and 101.3 kPa:	yellowish liquid with a weak odour
Boiling Point:	> 100°C
Density:	1 000- 1 100 kg/m^3
Vapour Pressure:	the notified polymer is not expected to be volatile
Water Solubility:	< 1 mg/L at 25°C
Particle Size:	not applicable as the notified polymer is a liquid
Partition Co-efficient (n-octanol/water):	not determined (see comments below)
Dissociation Constant:	no acidic or basic functional groups are present
Flash Point:	> 100°C
Flammability Limits:	Upper Explosive Limit = not determined Lower Explosive Limit = not determined
Autoignition Temperature:	not determined
Explosive Properties:	not expected to be explosive
Reactivity/Stability:	expected to be stable under normal environmental conditions; may undergo hydrolysis or decomposition under extreme temperature or pH conditions

Comments on Physico-Chemical Properties

No physico-chemical test reports were provided by the notifier.

The notifier expects that due to the insolubility or low solubility of the monomers the polymer will be insoluble or at most only slightly soluble. This statement has not been supported by data.

The polymer is reported to be stable, does not contain any reactive functional groups and is not expected to hydrolyse under normal environmental conditions, ie pH range 4-9. In cold water, starch is insoluble and will not hydrolyse (Budavari, 1989). However, without any testing, it is not possible to determine the impact of polymerisation or oxidation on solubility or hydrolysis.

4. PURITY OF THE CHEMICAL

Degree of Purity:	approximately 99.96%
Non-hazardous Impurities (> 1% by weight):	none
Maximum Content of Residual Monomers:	residual monomer identities and concentrations have been exempted from publication; concentrations of residual monomers are all below the relevant cutoffs for the notified polymer to be classified as hazardous

5. USE, VOLUME AND FORMULATION

The notified polymer will be used as a surface sizing agent added to paper and board to improve water repellancy and printability. It will be imported as a component of an aqueous product, Baysynthol AGP in 20 000 L ISO (International Standard Organisation) tanks.

The product containing the notified polymer will be blended with starch prior to its final use on rubber rolls as a film. The blended product will contain < 10% Baysynthol AGP containing less than 1% (w/w) notified polymer.

The notifier estimates that 120 tonnes of the new product, will be imported per annum for the first five years.

6. OCCUPATIONAL EXPOSURE

Transport and Storage
Baysynthol AGP is imported in 20 000L ISO tanks and transported by road to the warehouse for storage and from there to the customer site. Transport and storage workers are not expected to be exposed to the notified polymer during shipment except in the case of an accident involving spillage.

The notifier estimates that 5 to 10 workers will be involved in receiving and unloading the imported product at the docks, in road transport and at the warehouse. There are likely to be a maximum of 10 deliveries of the product containing the notified polymer per year with an exposure duration of 2 to 3 hours per day.

Application Plant
At the application site plant operators pump the product from the ISO tank to a bulk storage

tank and from there into a service tank, all using fixed piping. The uncovered service tank is located beneath the paper machine. Workers may be dermally exposed to drips and spills when connecting and disconnecting hoses and to splashes from the open service tank. The notifier indicates that these workers wear overalls, gloves and safety glasses. Within the service tank, Baysynthol AGP is mixed with starch prior to the mixture being applied as a film to rubber rolls then transferred to the paper passed between the rolls. The paper is dried and packed ready for use. This process is fully automated, therefore, no worker exposure is anticipated. Extractor fans are located around the paper machine to extract steam.

Workers at the application plant will be required to hose out empty ISO tanks, with washings entering the on-site waster water treatment plant. The notifier estimates that < 0.1% of the product will remain as residue within the tank. Workers will wear the protective gloves as specified above.

Three to six plant operators may be involved in the above procedure for a duration of 1 to 8 hours per day for 250 days/year.

7. PUBLIC EXPOSURE

During transport, storage and reformulation, public exposure to the notified polymer is expected to be low. Exposure of the general public to the notified chemical is only likely through contact with paper containing the dried bound polymer.

8. ENVIRONMENTAL EXPOSURE

Release

The notifier estimates that up to 0.1% of product will remain in empty import containers as residue. The containers will be cleaned on site with the resultant washwater going to the on-site wastewater treatment plant. Once cleaned the containers are returned to Germany for reuse.

The on-site bulk storage tank and transfer lines are enclosed within bunded areas. Release as a result of spills or line ruptures are unlikely but if they do occur the material will either be recycled or washed into the on-site wastewater treatment plant.

The application system is a closed circulation system with a flow rate of approximately 3000 L/hour of starch mixture. The notifier has indicated that approximately 98% of the starch mixture binds to the paper. Any overflow from the application apparatus is returned to the service tank for recycling. Release is also expected to occur (approximately 5%) during weekly apparatus cleaning.

All equipment washwater and any spills will be discharged to the on-site wastewater treatment plant (3,500 ML capacity). In the treatment plant, wastewater undergoes primary and secondary treatment with the treated effluent being recycled back into the paper mill, i.e. there is no release of effluent to the sewer. The notifier expects that up to 0.5% of the notified polymer will be coagulated during the primary treatment and end up in the resultant

sludge, which includes fibres and ink. The sludge is removed by a licensed waste contractor for disposal to landfill.

Fate

Sources of polymer that may reach the aquatic environment include spills during transport from the docks, which will be very minor, and in the sludge from the on-site wastewater treatment plant. Thus, approximately 0.5% of the imported polymer will end-up in landfill where it is unlikely to leach due to the expected low solubility. Starch is insoluble and will not hydrolyse in cold water. However, in the presence of acids or enzymes will hydrolyse/breakdown (Budavari, 1989), forming soluble products which may leach from landfill.

The fate of the majority of the polymer will be the same as that of the paper to which it is bound. The paper may be recycled, in which case the polymer is likely to end up in the sludge formed during the process and be disposed of to landfill. The majority of the paper is likely to be disposed of to landfill. The polymer bound to the paper will be inert not available for leaching.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicology data were submitted.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided. This is acceptable for polymers of low concern with a NAMW > 1000 according to the Act. The Material Safety Data Sheet (MSDS) for the polymer did include ecotoxicity data for fish, which indicated that the polymer was practically non-toxic to fish based on a "similarly composed product". However, the report was unavailable so this could not be confirmed.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The polymer will be applied to paper by the roller process. Any released in the process waste will go to the on-site wastewater treatment plant. The notifier has indicated that all the effluent from the on-site treatment plant is recycled within the plant and that up to 0.5% of the polymer is removed from the site in the sludge. It is unlikely that this polymer will leach from landfill. In a worse case scenario where the full volume of the circuit (ie. 3 000 L) went untreated to the sewer it would end up in the Werribee Treatment Plant, which handles 500 ML/day of effluent form Melbourne. This equates to < 30 kg of notified polymer in 500 ML, ie a concentration of < 0.06 mg/L.

The amount of notified polymer reaching the environment due to transport spills will be minor. The fate of the majority of the polymer will be the same as that of the paper to which it is bound, most of which will be disposed of to landfill. Once the polymer has bound to the paper it will be in a stable matrix and will not leach.

The environmental hazard posed by this polymer if used as described is low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

No toxicological information has been provided for the notified polymer. Therefore, the substance cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

The polymer is not reactive and non-volatile, and because of the high molecular weight is not expected to cross biological membranes. The notifier states that there have been no reported incidences of adverse effects on the occupational health of workers using the polymer overseas.

Occupational Health and Safety

Transport and storage workers will only be exposed to the notified polymer in the event of an accident. The occupational health risk to these workers is negligible.

At the application site, workers involved in connecting and disconnecting transfer hoses and flushing empty containers (short duration) may be exposed to the notified polymer. Considering that personal protective equipment is worn by these workers, that the concentration of the notified polymer in the product is low and that no toxicity is anticipated, the occupational health risk to these workers is negligible.

Due to the automated and enclosed nature of reformulation and application processes plant operators may be exposed to the notified polymer from splashes from the open blending tank and drips and spills from hoses only. Due to the low volatility of the polymer solution and the presence of extractor system around the paper machine inhalation exposure is considered unlikely. Considering the sporadic nature of these spills, the requirement for workers to wear personal protective equipment and the anticipated low hazard of the polymer occupational health risk due to these workers will be minimal.

Once the polymer is bound to the paper, it is not expected to be separately available for exposure or uptake. Therefore there is no risk for others handling treated paper in the workplace.

Public Health

The notified polymer will only be applied during paper treatment in an automated system, therefore public contact will only occur from touching the dried material on paper. The notified polymer binds strongly to paper/board fibre, and is unlikely to migrate from the fibre surface. Consequently, the potential for public exposure to the notified polymer during its use is considered to be minimal.

13. RECOMMENDATIONS

To minimise occupational exposure to the notified polymer the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 (Standards Australia, 1994) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990); impermeable gloves or mittens should conform to AS 2161 (Standards Australia/ Standards New Zealand, 1998); all occupational footwear should conform to AS/NZS 2210 (Standards Australia/ Standards New Zealand, 1994);

- 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;

- Good personal hygiene should be practised to minimise the potential for ingestion;

- A copy of the Material Safety Data Sheet (MSDS) should be easily accessible to employees.

14. MATERIAL SAFETY DATA SHEET

The MSDS for the product (Baysynthol AGP) containing the notified polymer was provided in accordance 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 subsection 64(1) of the Act, secondary notification may be required if the polymer characteristics cease to satisfy the criteria under which it has been accepted as a Synthetic Polymer of Low Concern. Secondary notification of the notified polymer may be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

16. REFERENCES

Budavari S, O'Neil MJ, Smith A and Heckelman PE (1989) The Merck Index. Merck and Co., Inc.

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.

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

Standards Australia (1987) Australian Standard 2919-1987, Industrial Clothing. Standards Association of Australia, Sydney.

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 (1994) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. 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.