

File No: EX/38 (NA/726)

30 October 2002

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

FULL PUBLIC REPORT

Solsperse HPA-4/Solsperse 32000

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT**Solsperse HPA-4/Solsperse 32000****1. APPLICANTS****Original Holder of Assessment Certificate (First Applicant)**

An Assessment Certificate for the notified polymer known by the name Solsperse HPA-4/Solsperse 32000 was granted to Orica Australia Pty Ltd of 1 Nicholson Street MELBOURNE VIC 3000.

The Assessment Report for Solsperse HPA-4/Solsperse 32000 is identified by the sequence number NA/726.

Second Applicant

Since granting of the abovementioned Assessment Certificate, Sericol Australia Pty Ltd (ABN No. 66 075 733 069) of 4 Coronation Avenue, Kings Park, NSW 2148 has submitted a notification statement in support of their application for an extension of the original Assessment Certificate for Solsperse HPA-4/Solsperse 32000. Orica Australia Pty Ltd has agreed to this extension.

Information submitted by Sericol Australia Pty Ltd pertains to the introduction of the notified polymer for use as a component in packaging gravure inks. The end use products will be distributed nation wide. Sericol Australia Pty Ltd will be importing 0.6 tonne per year.

2. IDENTITY OF THE CHEMICAL

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

Marketing Name: Solsperse HPA-4 (the notified chemical);
Solsperse 32600; Solsperse 32550; Solsperse 32500;
Solsperse 31845; and Solsperse 34750 (products).

3. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance at 20°C
and 101.3 kPa:**

A yellow waxy solid (preparations are amber liquids)

Melting Point:	Approximately 30°C
Relative/Density:	1.11 at 20°C
Vapour Pressure:	Not volatile
Water Solubility:	46 mg/L at 25°C
Partition Co-efficient (n-octanol/water):	log P _{ow} =2.4 at 25°C
Particle Size:	Not applicable as polymer will only be imported in solution.
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).
Flash Point:	Not determined
Flammability Limits:	Not determined
Autoignition Temperature:	Not determined
Explosive Properties:	Expected to be stable
Reactivity/Stability:	Expected to be stable but like other organic compounds should be segregated from oxidising agents.

Comments on Physico-Chemical Properties

Tests were performed according to the guidelines given in “Methods for the Determination of Physico-Chemical Properties”, Official Journal of the European Communities L 383A Vol 35, 29th December 1992, at facilities complying with OECD Principles of Good Laboratory Practice.

The notifier claims, via analogue data for a similar polymer, that the notified polymer is not volatile. The vapour pressure of the polymer solution would be similar to the vapour pressure of the solvent being used.

The polymer contains ester groups that could undergo hydrolysis under extreme pH conditions. Since environmental pH conditions range between 4 and 9 hydrolysis of the polymer is unlikely.

The polymer is moderately soluble with a water solubility of 46 mg/L. It has a relatively high n-octanol solubility of 5.1% w/v, indicating a tendency towards lipophilicity. The log P_{ow} of 2.4 supports this.

The notifier has not provided an adsorption/desorption value but has indicated that the polymer would be expected to associate with soil and sediment. From the information provided this statement cannot be confirmed. However, with a log Pow of 2.4 the polymer will have a slight tendency to adsorb onto surfaces in soil and sediments. Dispersant polymers have a tendency to bind to organic material within soils and sediments (Guiney, 1997).

No dissociation constant has been provided. The notifier states that the polymer contains no structural units that would dissociate. However, interpretation of the structure provided in the submission indicates the presence of an NH^+ . At higher pH, this quaternary ammonium cation will undergo dissociation to the free tertiary amine and a hydrogen ion.

4. PURITY OF THE CHEMICAL

Degree of Purity: 98.9% (w/w)

Additives/Adjuvants:

<i>Product</i>	<i>% Notified Chemical</i>	<i>Solvent</i>
Solsperse 32600	40%	Solvesso 100
Solsperse 32550	50%	n-Butyl acetate
Solsperse 32500	40%	n-Butyl acetate
Solsperse 31845	45%	n-Butyl acetate and methoxy propyl acetate
Solsperse 34750	50%	Ethyl acetate

5. USE, VOLUME AND FORMULATION

Solsperse HPA-4 will be used as a polymeric dispersant in automotive and industrial paints, and packaging gravure inks.

Solsperse HPA-4 will not be manufactured in Australia. It will be imported in preparations containing 40-50% of the notified polymer in organic solvents. Solsperse HPA-4 preparations are in steel pails and drums of 20, 25 and 200 L. The imported preparations will be reformulated into paints or inks in Australia. The formulated products will be packed in 20 L steel pails or 200 L steel drums. The notified polymer is at levels up to 3% by weight in paint and ink products.

The notifier estimates that 1 tonne will be imported in the first year and 1 to 10 tonnes per year in the following four years. Half of the import volume will be used in ink application. Among the other half amount, volume percentages in rolling/dipping and spray coating will be approximately 40% and 60%, respectively.

The notified polymer will be imported by Sericol Australia Pty Ltd at a rate 0.6 tonnes per year for the first 5 years. The notified polymer will be imported in 5 L plastic pails as an ingredient of ink preparations at a concentration of 10%.

6. OCCUPATIONAL EXPOSURE

Dermal and inhalation exposure are considered possible for the notified chemical. Although the vapour pressure of the notified polymer is expected to be low based on the data from similar polymers, occupational exposure via inhalation is possible due to volatile organic solvents used in the preparations. Workers who will handle the notified polymer include transport and storage workers, formulators, paint and ink applicators.

Transport and storage

After importation, the products containing the notified polymer will be transported to the notifier's plant. They will be stored in original containers in a bonded licensed dangerous goods storage site. Repackaging is not envisaged. The products will be distributed to

formulation sites by road. Both the notified polymer preparations and the reformulated products will be packed in steel pails or drums.

An estimated 10 transport and storage workers will handle the notified chemical, working 200 days per year. These workers would only be exposed to the notified polymer in the case of an accident where the packaging was breached.

Paint and ink formulation

It is expected that up to 5 ink manufacturers and 10 paint manufacturers will use the preparations containing the notified polymer. Reformulation procedures for paint and ink products were similar at the formulation plants and can be illustrated as follows:

The notified polymer and other ingredients \Rightarrow High speed dispensing and blending in mixer \Rightarrow Batch adjust and testing \Rightarrow Filtration and filling \Rightarrow Warehouse for distribution

Reformulation workers will handle the imported solution, containing 40-50% of the notified polymer. The notifier estimated that there will be 40 high speed dispensing workers working 4 hours per day, 40 colour make-up workers working 2 hours per day, 10 quality controllers working 8 hours per day, and 40 fillers working 8 hours per day. It is expected that formulation with Solspers HPA-4 would be conducted on approximately 30 days per year.

The product containing the notified polymer is a viscous and tacky liquid. Workers who operate the high speed mixers will measure the polymer solution manually, add it to the mixer and blend it with other ingredients. Colour make-up workers will adjust colour for each batch. Occupational exposure through direct dermal contact or splashing may occur during this process. In addition, inhalation exposure due to the solvents is possible. However, the duration of exposure is short. The notifier stated that exhaust ventilation would be fitted in the formulation sites to capture volatiles at source. A regular maintenance program is pursued and includes measurement of air flows at determined intervals. For workers handling the polymer solution, and paint and ink products, the notifier indicated that the minimum personal protection equipment would be impervious gloves, overalls and goggles.

Quality control workers will collect samples from high speed mixers to test in the laboratory. They could also be exposed to the notified polymer. All quality control testing is performed in an approved booth subject to regular maintenance procedures. Quality control workers are expected to wear gloves, goggles and protective clothing when performing their duties.

The filtration and filling procedures are typically carried out in an automatic closed system. Dermal exposure during filtration and filling may occur if overfilling and spillage occurs during this process.

Waste polymer and formulations containing up to 3% polymer at formulation sites are collected and disposed by licensed waste disposal contractors. The in-house clean-up and maintenance workers may be exposed to residual paint or ink products in the equipment.

Paint application

There are three types of paint application for the products containing the notified polymer namely spray, roller coating and dipping. The notifier estimated that there would be 10 preparation workers working 8 hours per day, 20 sprayers working 8 hours per day and 30 cleaners working 2 hours per day. They would be exposed to the notified chemical at up to 3% for 200 days per year.

Spray painting has a high potential for occupational exposure. Spray painters who will be exposed to the notified polymer are expected to be fully TAFE trained. Typically the spray painter will measure the appropriate amounts of the different components required in a particular formulation, including the pre-prepared paint containing the notified polymer, into an open container and pour this mixture into a spray gun. The spraying will be carried out in a laminar flow downdraft spray booth which is designed to rapidly remove aerosol particles and solvent vapour from the atmosphere. Several possible booth designs may be used. In a dry floor booth, the overspray will be collected in filters contained in the floor of the booth; any unremoved particulates will reach the exhaust stack with the solvent vapours. In a wet floor booth, overspray will collect in a pool of water below the grill floor or in a wet scrubber in the exhaust and will be removed with a filter. The residual solids will be disposed of to secure landfill. The spray booths are subject to AS/NZS/4114.1:1995 *Spray Painting Booths – Design, Construction and Testing* and AS/NZS/4114.1:1995 *Spray Painting Booths – Selection, Installation and Maintenance*. Spray painters normally wear appropriate personal protective equipment at all times; gloves and overalls while mixing the paint, and, in addition, a full face shield and respirator while inside the spray booth.

Roller coating application is usually performed in a booth like that used in spray painting. Aerosol are unlikely to be generated during roller coating. Painters will wear personal protective equipment including overalls, gloves and safety spectacles (or goggles) while mixing and applying the paint, and a cartridge respirator if volatile solvents are used.

Paint application by dipping can be performed manually or by use of mechanical equipment. Painters do not manually insert individual objects into the paint. Usually, objects are fitted to a holder or frame that is lowered manually or automatically into the paint. Paint sits in a large container or trough during dipping application. Some splashing may occur during this process. Inhalation exposure to volatile solvents is possible. Dipping applicators will wear overalls, gloves and safety spectacles (or goggles). A cartridge respirator is used when volatile solvents are used.

Residual paint will be washed from the equipment manually, using recycled paint solvent, and the washings will be disposed of by solvent recyclers.

Once residual final paint mixture has dried, the notified polymer will be irreversibly bound within the cured matrix. It will not be separately available for either worker exposure, or dermal absorption.

Ink application

The notifier provided an illustration of a typical flexographic printing unit for ink application. Ink application is an automatic process. Exposure may occur when workers transfer ink containing up to 10% of the notified polymer from drums to the ink troughs. The task is carried out with a pump, with workers connecting and disconnecting transfer lines, or by

workers manually measuring the required amount. Skin contamination may occur during transfer particularly when manually operations are involved.

Workers clean the equipment daily and maintenance workers service the equipment. Residual paint is usually washed from the equipment manually, using recycled paint solvent, and the washings will be collected by solvent recyclers. Workers could be exposed to the notified polymer at up to 10% via dermal contamination. Residues in the equipment will be small. Therefore, the exposure to the notified polymer during clean up is considered to be low.

The notifier estimated that there would be 200 ink applicators and equipment cleaners, each potentially exposed 8 hours per day throughout the year.

In the ink application sites, ventilation will be provided to maintain solvent concentrations below the relevant exposure standard. Both ink applicators and equipment cleaners will wear overalls, safety glasses and gloves.

7. PUBLIC EXPOSURE

The notified polymer will be used only in industry. The potential for public exposure to the notified polymer during reformulation, transport and coating operations or from disposal is assessed as negligible. Although members of the public will make dermal contact with articles such as automobiles and packaging materials coated with paint or ink containing Solsperse HPA-4/Solsperse 32000, exposure will be low because of the low concentration (up to 10%) and the cured state of the notified polymer in these coatings.

8. ENVIRONMENTAL EXPOSURE

Release

Spills would account for any loss of the polymer during transport and the initial warehouse storage. In the warehouse, spills will be contained via bunding. There is potential for loss of the polymer during manufacture or use due to spills, drum residue and equipment cleaning.

Drums will be drained and rinsed by the manufacturers and users. The resultant washwater will either be returned to the production line or it will be combined with the other waste streams. After rinsing it is estimated that a maximum residual of 0.5% of the polymer will remain in the drum, namely 50 kg/yr. The drums will be sent to drum recyclers who will dispose of the 0.5% residue by incineration during the preparation of the drums for reuse.

At the coating manufacture sites the solvent is recovered, via a distillation process, from the combined waste streams and the resultant solid sludge/residue will be disposed of to landfill. The notifier has indicated that annually 200 kg of solid residue will be generated after solvent recovery.

Each method of paint application results in loss of material. In spray painting the loss due to overspray has been given as 60% (1800 kg/yr). For roller/ dipping application the loss has been given as 2% (40 kg/yr). The notifier has indicated that with ink application there is

likely to be a 2% loss (100 kg/yr). The estimated total loss due to equipment cleaning is 1% (100 kg/yr). Therefore, the notifier estimates that 2 tonnes of waste will be generated annually from all the user sites combined. This will be collected and disposed of by licensed waste disposal contractors who will presumably take it to landfill or incineration.

Fate

The final fate of the polymer will be the same as the coated article, ie either recycled or sent to landfill. During the recycling process the coating (incorporating the polymer) will either be removed and become part of a solid/sludge waste that will go to landfill or incineration, or destroyed by a process such as smelting. Incineration of the paint film would emit noxious fumes including oxides of carbon and nitrogen.

Leaching of solid waste containing the polymer from landfill is unlikely, because of the polymer's moderate water solubility and affinity for soil.

The polymer is not expected to cross biological membranes due to its high molecular weight and moderate solubility, therefore should not bioaccumulate (Connell, 1989).

9. EVALUATION OF TOXICOLOGICAL DATA

9.1 Acute Toxicity

Summary of the acute toxicity of Solsperse HPA4

<i>Test</i>	<i>Species</i>	<i>Outcome</i>	<i>Reference</i>
acute oral toxicity	rat	LD ₅₀ > 2 000 mg/kg	(Allen, 1997c)
Skin irritation	rabbit	Slight skin irritant	(Allen, 1997a)
eye irritation	rabbit	Slight eye irritant	(Allen, 1997b)
skin sensitisation	guinea pig	Not sensitising	(Allen, 1997d)

9.1.1 Oral Toxicity (Allen, 1997c)

<i>Species/strain:</i>	Rat/Sprague-Dawley
<i>Number/sex of animals:</i>	5/sex
<i>Observation period:</i>	14 days
<i>Method of administration:</i>	Oral (gavage), a single dose of 2 000 mg/kg in arachis oil
<i>Test method:</i>	Limit test, OECD TG 401
<i>Clinical observations:</i>	No signs of systemic toxicity were noted during the study.
<i>Mortality:</i>	None

<i>Morphological findings:</i>	No abnormalities were noted at necropsy.
<i>Comment:</i>	None
<i>LD₅₀:</i>	> 2 000 mg/kg
<i>Result:</i>	the notified chemical was of very low acute oral toxicity in rats

9.1.2 Skin Irritation (Allen, 1997a)

<i>Species/strain:</i>	Rabbit/New Zealand White
<i>Number/sex of animals:</i>	3 males
<i>Observation period:</i>	7 days
<i>Method of administration:</i>	The notified chemical was pulverised and warmed to produce a paste for application. The notified chemical (0.5 mL) was applied on the shorn skin for 4 hours under a semi-occlusive dressing.
<i>Clinical observations:</i>	Erythema and oedema were observed after treatment (see Draize scores).
<i>Test method:</i>	OECD TG 404
<i>Mortality:</i>	None
<i>Morphological findings:</i>	Not performed

Draize scores (Draize, 1959):

ANIMAL	<i>Time after treatment (days)</i>				
	<i>1 hour</i>	<i>1 day</i>	<i>2 days</i>	<i>3 days</i>	<i>7 days</i>
<i>Erythema</i>					
1	ⁱ 2	1	1	1	0
2	1	1	0	0	0
3	2	1	1	1	0
<i>Oedema</i>					
1	1	0	0	0	0
2	0	0	0	0	0
3	1	0	0	0	0

ⁱ see Attachment 1 for Draize scales

Comment: None

Result: The notified chemical was a slight skin irritant in rabbits.

9.1.3 Eye Irritation (Allen, 1997b)

Species/strain: Rabbit/New Zealand White

Number/sex of animals: 3 males

Observation period: 72 hours

Method of administration: The notified chemical (0.1 mL) was instilled into the conjunctival sac of the right eye; the left eye remained untreated and was used for control purposes.

Test method: OECD TG 405

Draize scores (Draize, 1959):

	<i>Time after instillation</i>											
<i>Animal</i>	<i>1 hour</i>			<i>1 day</i>			<i>2 days</i>			<i>3 days</i>		
<i>Conjunctiva</i>	<i>r</i>	<i>c</i>	<i>d</i>	<i>r</i>	<i>c</i>	<i>d</i>	<i>r</i>	<i>c</i>	<i>d</i>	<i>r</i>	<i>c</i>	<i>d</i>
1	¹ 2	1	² 2	1	1	² 1	1	1	² 1	0	0	² 0
2	1	1	2	0	0	0	0	0	0	0	0	0
3	1	1	2	0	0	0	0	0	0	0	0	0

¹ see Attachment 1 for Draize scales,

² staining of the fur around the treated eye,

r = redness c = chemosis d = discharge

Draize scores for cornea and iris were all zero after the treatment.

Comment: The notified chemical was warmed to produce a paste for application.

Result: the notified chemical was slightly irritating to the eyes of rabbits

9.1.4 Skin Sensitisation (Allen, 1997d)

Species/strain: Guinea pig/Dunkin Hartley

Number of animals: 20 male in the test group & 10 males in the control group

Induction procedure:

test group:
day 0 The notified chemical (75% w/w in 80% aqueous ethanol) on a saturated cotton lint patch was applied to the shorn left flank for 6 hours under an occlusive dressing.

day 7 and 14 The induction procedure was repeated on the same site on day 7 and day 14.

control group: The topical applications followed the same procedure as for the test animals except that the vehicle alone was applied.

Challenge procedure:

day 28 The notified chemical (75% w/w in acetone) on a saturated cotton lint patch was applied to the shorn right flank for 6 hours under an occlusive dressing. To ensure that the maximum non-irritant concentration was used at challenge, the notified chemical (50% w/w in acetone) was similarly applied to a separate skin site on the right shorn flank.

Test method: Buehler test, OECD TG 406

Challenge outcome:

Challenge concentration	Test animals		Control animals	
	24 hours*	48 hours*	24 hours	48 hours
75%	**0/19	0/19	0/9	0/9
50%	0/19	0/19	0/9	0/9
* time after patch removal				
** number of animals exhibiting positive response				

Comment: One control group animal was found dead on day 12, the cause of death was not determined. One test group animal was killed on day 14.

Result: the notified chemical was not sensitising to the skin of guinea pigs

9.2 Genotoxicity

9.2.1 *Salmonella typhimurium* Reverse Mutation Assay (Callander, 1997)

Strains: *S. typhimurium* TA1535, TA1537, TA98 AND TA100 and *E. coli* WP2P and WP2P *uvrA*

Concentration range: 100, 200, 500, 1 000, 2 500, and 5 000 µg/plate in the presence and absence of S9 metabolic activation (vehicle: DMSO).

Test method: OECD TG 471 and 472

Comment: The sensitivity of the test system and the metabolic activity of the S9 mix were clearly demonstrated by the positive control substances. Slight precipitation of the notified chemical was observed at 5 000 µg/plate.

Result: The notified chemical was not mutagenic in *S. typhimurium* and *E. coli* strains in both the presence and absence of S9 mix.

9.3 Overall Assessment of Toxicological Data

Several toxicological studies on the notified chemical were provided. The notified chemical was of very low acute oral toxicity (LD₅₀ > 2 000 mg/kg) in rats. It was a slight skin and eye irritant in rabbits. A Buehler test indicated that the notified chemical was not a skin sensitiser in guinea pigs. In an Ames test, the notified chemical was not mutagenic in strains of *S. typhimurium* and *E. coli* both in the presence and absence of metabolic activation.

Based on the available toxicological studies, the notified chemical is not classified as a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a).

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

Once the coating (paint or ink) is applied, the polymer will be incorporated in an inert film and consequently should not present a hazard. Any chips, flakes or fragments formed by mistreatment or general wear and tear will be inert. The paint will slowly deteriorate due to exposure to UV light and the other elements, but this will be insignificant.

The majority of waste containing the polymer will be generated during the manufacture and use of the coatings. This waste will be disposed of to landfill or by incineration. The polymer itself is unlikely to leach from a landfill due to its solubility and potential affinity for soil. The majority of the polymer will be present within the cured inert coating matrix, and therefore will be unavailable for leaching.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Solsperse HPA-4 showed low acute oral toxicity in rats, was a slight eye and skin irritant in rabbits, but was not a skin sensitizer in guinea pigs. In a bacterial reverse mutation assay, the notified polymer was not mutagenic. The acute dermal toxicity of the notified polymer is not known, but expected to be low considering the high molecular weight and low acute oral toxicity. Solsperse HPA-4 would not be classified as a hazardous substance according to NOHSC *Approved Criteria for Classifying Hazardous Substances* (National Occupational Health and Safety Commission, 1999a).

Solsperse HPA-4 will be imported into Australia in a variety of preparations (section 4). Considering the known solvents, Solvesso 100 and methoxy propyl acetate are on the NOHSC *List of Designated Hazardous Substances* (National Occupational Health and Safety Commission, 1999b). Solsperse 32600 contains 60% Solvesso 100. Solvesso 100 (solvent naphtha [petroleum] light aromatic, CAS no. 64742-95-6) has a cut-off concentration of 0.1% for toxic effects. It contains R45(2) (May cause cancer, carcinogen category 2) and R65 (Harmful: May cause lung damage if swallowed). Methoxy propyl acetate (2-methoxy-1-methylethyl acetate, CAS no. 108-65-6) has the risk phrases R10 (Flammable) and R36 (Irritating to eyes), and a cut-off concentration of 20% for irritation effects. The MSDS for all the preparations were provided for assessment and list a number of potential health effects, namely skin, eye and respiratory irritation, headache, dizziness, nausea, central nervous system depression, loss of co-ordination, impaired judgement, and even unconsciousness. Health effects relate mainly to solvents and additives, rather than the notified polymer, and are considered to outweigh any health effects associated with the notified chemical.

Occupational Health and Safety

Transport and storage

There should be no occupational exposure to the notified polymer during transport and storage of the preparations and products as long as the packaging remains intact. Therefore the health risk due to the notified polymer to the transport and storage workers is low. Preparations containing Solsperse HPA-4 and formulated paint and ink products are Class 3 dangerous goods and regulated under the ADG Code.

Paint and ink formulation

Workers at paint and ink formulation sites may handle mixtures containing up to 50% of the notified chemical. However, as the mixing and filling process are enclosed, exposure will be controlled and therefore the risk of adverse effects is low. Personal protective equipment such as overalls, gloves and goggles or spectacles should be worn to protect against solvent contamination.

Paint application

The final paint mix, including the paint products containing the notified polymer, could contain a wide variety of additional ingredients once fully mixed. This is likely to introduce human health hazards arising from ingredients such as potentially toxic solvents. The spraying procedure also produces a dense aerosol of paint particles which would adversely affect human health even in the absence of additional hazardous components. Although no aerosol of paint particles will be generated in the cases of roller coating and dipping, inhalation exposure is possible if volatile solvents are used.

For these reasons, the notified polymer is assessed for the contribution it makes to the hazards associated with use of the paints. The presence of many potential and actual hazardous substances in the formulations requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and a high level of personal protective equipment, such as impermeable overalls, gloves and a full face shield and respirator. The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the notified polymer, which is likely to be less intrinsically toxic than most of the solvents, pigments and other paint resins.

The use of spray paint containing the notified polymer should be in accordance with the NOHSC *Draft National Code of Practice for Spray Painting* (National Occupational Health and Safety Commission, 1991).

Once the applied final paint mix has hardened, the polymer will not be separately available for exposure or absorption.

There are NOHSC exposure standards for ethyl acetate and butyl acetate (National Occupational Health and Safety Commission, 1995), identified as ingredients in the preparations of the notified polymer. The employer is responsible for ensuring that these exposure standards, and exposure standards pertaining to other final paint mix additives, are not exceeded in the workplace.

Paint containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads. Operators should wear antistatic overalls and footwear.

Similar considerations apply in the disposal of the polymer. The wastes containing the notified polymer may be hazardous substances on the basis of the solvent and other resin content, and the precautions used on the basis of these additional materials should be adequate for protection from the notified polymer. In addition, much of the polymer will be crosslinked, hardened and immobilised by the time of disposal.

Ink application

Ink application involves the use of flexographic printing units which are automatically operated. However, workers may be exposed to the notified polymer daily during transfer of ink products from drums to the ink trough, especially if transfer is manual. Equipment cleaners will have frequent exposure to the polymer, however, given the low concentration and low toxicity, the risk of adverse health effects arising from exposure is low. Once fixed to the paint matrix, the notified chemical will not be separately available for exposure or absorption.

Solvent emissions at ink application sites must be controlled by local exhaust ventilation and workers should wear overalls, safety glasses and protective gloves. The selection of gloves should be those most resistant to the solvent used in ink printing.

Public Health

As the notified polymer is used within the paint and ink industry and public exposure is expected to be very low, it is considered that the notified chemical will not pose a significant hazard to public health when used in the proposed manner.

13. RECOMMENDATIONS

To minimise occupational exposure to Solspense HPA-4/Solspense 32000 the following guidelines and precautions should be observed:

For spray painting workers:

- Handling the paint containing the notified chemical should be in accordance with the NOHSC *Draft National Code of Practice for Spray Painting* (National Occupational Health and Safety Commission, 1991) including the use of safety goggles, respirators, industrial clothing, impermeable gloves or mittens and occupational footwear;

For other workers:

- 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);
- Respirator should be selected and fitted in accordance with AS/NZS 1716 and 1715 (Standards Australia/Standards New Zealand, 1994b) (Standards Australia/Standards New Zealand, 1994a);

- Industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.1 (Standards Australia, 1990);
- Impermeable gloves should conform to AS/NZS 2161.2 [Standards Australia/Standards New Zealand, 1998 #17];
- All occupational footwear should conform to AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994c);
- Spillage of the notified chemical should be avoided. Spillages should be cleaned up promptly with absorbents which should be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the MSDS should be easily accessible to employees; and
- Employers should ensure the NOHSC exposure standards for ethyl acetate and butyl acetate will not be exceeded in the workplace.

If the conditions of use are varied from the notified use, greater exposure of the public may occur. In such circumstances, further information may be required to assess the hazards to public health.

14. MATERIAL SAFETY DATA SHEET

The MSDS for products containing the notified chemical were provided in a format consistent with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (National Occupational Health and Safety Commission, 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.

A Material Safety Data Sheet for Uvivid FL, which contains the notified polymer Solsperse HPA-4/Solsperse 32000 was provided by Sericol Australia Pty Ltd in a format consistent with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 1994b). The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

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

16. REFERENCES

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

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

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

Standards Australia/Standards New Zealand (1998) AS/NZS 2161.2:1998 Occupational protective gloves, Part 2: General requirements, Standards Australia/Standards New Zealand.

Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

<i>Erythema Formation</i>	<i>Rating</i>	<i>Oedema Formation</i>	<i>Rating</i>
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising)	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

CORNEA

<i>Opacity</i>	<i>Rating</i>	<i>Area of Cornea involved</i>	<i>Rating</i>
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

CONJUNCTIVAE

<i>Redness</i>	<i>Rating</i>	<i>Chemosis</i>	<i>Rating</i>	<i>Discharge</i>	<i>Rating</i>
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

IRIS

<i>Values</i>	<i>Rating</i>
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe