

File No: NA/617

December 1998

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

SURCOL 860

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT**SURCOL 860****1. APPLICANT**

Allied Colloids (Aust) P/L of 6-8 Donaldson St WYONG NORTH NSW 2259 has submitted a limited notification statement in support of their application for an assessment certificate for SURCOL 860.

2. IDENTITY OF THE CHEMICAL

The following requests for exempt information were accepted: chemical name, CAS No., molecular and structural formulae, constituents, spectral data and exact import volume.

Trade Name: SURCOL 860

**Method of Detection
and Determination:** infrared spectroscopy

3. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance at 20°C
and 101.3 kPa:** white powder

Melting Point: 115 – 125°C

Density: 1 180 kg/m³

Water Solubility: < 0.1%

**Partition Co-efficient
(n-octanol/water):** not determined - see comments below

**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

Particle Size:	<i>Diameter (µm)</i>	<i>Weight %</i>
	600 – 1 000	11.3
	425 – 600	47.6
	355 – 425	30.1
	250 – 355	10.2
	150 – 250	0.7
	< 150	0.1

Comments on Physico-Chemical Properties

The water solubility of the notified polymer was determined by a simple bench test method. This type of test will measure the water accommodated fraction of the notified polymer. Three different batches of polymer were examined, where 50 g of polymer bead was mixed with 50 g of deionised water and shaken. The bead was then filtered off and a dry weight analysis was performed on the remaining filtrate. The percentage dry weights were 0.0401, 0.0738 and 0.0511, equating to 401 mg/L, 738 mg/L and 511 mg/L, respectively. The significant levels of an organic acid (one out of every seven polymer units) are likely to be responsible for this water solubility.

Hydrolysis of the polymer backbone is not expected as it contains no hydrolysable groups. However, hydrolysis of the sidechains is possible but likely to be slow in the environmental pH range. Water solubility could be expected to increase with hydrolysis. As a solid, the polymer will partition to soil and sediment. The notifier claims the water soluble fraction of the polymer will have a pK_a similar to a polymer of the organic acid which is one of the monomers, i.e. approximately 5.

4. PURITY OF THE CHEMICAL

Degree of Purity: 97%

**Toxic or Hazardous
Impurities:** 0.28%

**Non-hazardous Impurities
(> 1% by weight):**

<i>Chemical Name</i>	<i>CAS No.</i>	<i>Weight %</i>
water	7732-18-5	approx. 3%

Additives/Adjuvants: none

5. USE, VOLUME AND FORMULATION

The notified chemical will be used in the inks and coatings industry as a constituent (to a maximum of 50% w/w) in a water-based sealer for lithographically printed paper and board. Imports of the notified substance are estimated to be less than 10 tonnes per year.

6. OCCUPATIONAL EXPOSURE

The notified chemical will be imported to Australia in 25 kg plastic heat-sealed valve bags and transported to the notifier's warehouse. At the warehouse the bags will be unpacked and stored or transported to the industrial customers. Ten to twenty workers will be involved in the transport and handling of the material from the wharf to the warehouse and from the warehouse to the industry.

Workers involved in transport and storage should only be exposed to the chemical in the event of accidental spillage.

At the customer process site, blenders weigh the solid material and manually pour it into a mixing vessel containing the other constituents. Mechanical stirring is used to dissolve the material and the resulting viscous liquid is pumped pneumatically into 4 L polyethylene pails under local exhaust ventilation by an automated process. A maximum of 500 workers will be exposed to the notified chemical. Handling is approximately 2-3 hours per day, 8-12 days per year. The notifier states that blending personnel are required to wear coveralls, gloves and safety glasses during the manufacturing operation. The mixing vessel is stated to be fitted with local exhaust ventilation.

Laboratory quality control staff sample and test the finished product to ensure that it is within specification. They are required to wear lab coats, gloves and eye protection.

Printers use the sealer during printing operations. They add water-based sealer as required either by pouring or transferring it with a knife to a printing unit of the printing machine. Potential exposure to printers is approx. 8 hours/day, 50 – 150 days a year.

Skin contact may occur during the addition of sealer to the printing units, however, the notifier stated that spillage was unlikely due to the high viscosity. Printers are required to wear coveralls, gloves and eye protection during machine wash up at the completion of a job.

Workers handling printed packaging should not become contaminated with the notified chemical because it becomes incorporated into the printed film and adheres to the packaging surface.

7. PUBLIC EXPOSURE

The notified polymer or reformulated product are for industrial use only and will not be available to the public. Public exposure during transport, storage, reformulation or disposal is expected to be negligible.

The public may come in contact with products printed with the notified polymer. The polymer, together with other ingredients will adhere to the substrate so that public exposure should not occur.

8. ENVIRONMENTAL EXPOSURE

Release

The blending process is described as efficient with losses of the notified polymer estimated at 1-2%, with releases mainly as a result of washing the blending equipment. These washings are collected in drums and disposed of to a licensed waste disposal contractor. The washings will be treated at the waste processing plant at Lidcombe, where it is expected they will represent a small proportion of the total wastes treated at the plant.

Losses of the polymer during printing operations should also be limited to clean-up. This will be controlled with residue collected in a similar fashion as described above for the blending operations. Empty packaging, i.e. the plastic valve bags and polyethylene pails, will be disposed of to landfill with other used pigment and resin packaging.

It is expected that cartons coated with the sealer will be disposed of to landfill, incinerated or recycled once emptied of their contents.

Fate

The vast majority of the notified polymer will be associated with and bound strongly to the packaging surface. Waste paperboard is disposed of through incineration, recycling or deposition into landfill.

Incineration will destroy the polymer. Similarly, it is expected that during the repulping and bleaching procedures employed during paper/carton recycling, the chemical will be either

destroyed chemically or, if it survives, be incorporated into the waste sludge. Waste sludge from the recycling plants will be either incinerated or disposed of to landfill, while aqueous wastes will be comprehensively treated before discharge.

Some waste cartons may be disposed of directly to landfill, and it is anticipated that prolonged residence in an active landfill environment will eventually degrade the polymer sealer. The same considerations will apply to waste sludge from paper recycling if disposed of to landfill.

Waste polymer product discharged to waste processing plants during product (sealer) manufacture and application should partition to the sludge during treatment. After dewatering, the sludge is either incinerated or disposed of to landfill.

The notified polymer is not expected to cross biological membranes due to its high molecular weight, and as such should not bioaccumulate (Connell, 1989).

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were submitted.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were submitted.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The majority of notified polymer should not enter the environment until the packaging surfaces to which it is applied as a very thin printed film are disposed of. Disposal of the notified polymer to landfill is unlikely to present a hazard to the environment, as it is not expected to be mobile. The sealer should remain adhered to the packaging surface.

Disposal of waste packaging coated with the sealer product is expected to be through landfill, incineration or recycling. In all three cases it is anticipated that the polymer will be destroyed either through the agency of a vigorous chemical environment or through slow biological or abiotic processes. Even in the absence of substantial degradation, the diffuse nature of disposal patterns indicate slow release into the wider environment.

Approximately 400 kg of waste polymer per annum (at maximum import volumes) derived during sealer product manufacture and application will be disposed of to liquid waste processing plants. However, the amount of waste is more likely to be 80 kg per annum based on estimates provided by the notifier on likely consumption rates, thereby minimising the hazard associated with this means of disposal.

The main environmental hazard would arise through spillage in transport accidents that may

release quantities of the polymer to drains or waterways. However, the low solubility of the substance suggests it will partition to sediments and remain immobile pending collection and disposal. The Material Safety Data Sheet (MSDS) contains adequate directions for dealing with such spills.

The low environmental exposure to the polymer as a result of the proposed use indicates that the overall environmental hazard should be low.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified polymer satisfies all the criteria for a polymer of low concern specified in regulation 4A of the Act except for the water solubility criterion. The polymer can be considered of low hazard to human health. No toxicology data were provided for assessment. The physical form of the polymer, as a powder, presents a health hazard in terms of nuisance dust. Therefore, the NOHSC exposure standard of 10 mg/m³ (National Occupational Health and Safety Commission, 1995) should be adhered to and good local and general ventilation employed. The particle size of the powder indicates that it is virtually non-respirable. The MSDS states that the notified chemical may cause skin irritation on prolonged exposure. The notifier states that temporary skin irritation can occur in some cases where the natural oils of the skin are absorbed onto a polymer powder following prolonged contact.

During blending of the polymer, the powder is weighed and poured manually into the mixing vessel. The notifier states local exhaust ventilation is employed during these operations so that exposure should be controlled. The notifier states that workers are required to wear coveralls, gloves and safety glasses, further controlling exposure. Following mixing, the resultant sealer is said to be of high viscosity and is pumped pneumatically into 4 L polyethylene pails by an automated process.

Quality control activities are stated to be carried out on small samples, by laboratory personnel wearing laboratory coats, gloves and safety glasses. Exposure under these circumstances should be negligible.

Printers add the finished sealer to the printing unit of printing machines by pouring or by application with a broad, blunt bladed “knife” or spatula. Dermal exposure to the notified chemical may occur during the printing operation and clean-up of equipment after the job. Protective equipment is worn during clean-up. However, it appears that few controls are in place during printing.

Overall, the risk of adverse health effects to workers involved in transport, storage, use or disposal of the notified polymer should be low because of the anticipated low health hazard and limited opportunities for exposure. Exposure appears to be minimised primarily through the use of engineering controls and personal protective equipment. The most likely adverse health effect may be eye or respiratory irritation following exposure to the notified chemical in powder (or dust) form during weighing of the notified polymer and its addition to a mixing vessel.

Public contact with paper products printed with the notified polymer may occur. However, since the notified polymer has a high molecular weight and is adhered to the printing substrate, absorption across biological membranes is expected to be negligible. Accidental spills will have minimal public health effects if the spills are collected and disposed of as outlined in the MSDS. The proposed use is unlikely to pose a significant health risk to the public.

13. MATERIAL SAFETY DATA SHEET

The MSDS for the notified chemical was provided in accordance 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.

14. RECOMMENDATIONS

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

- Effective local and general exhaust ventilation should be employed during weighing out and addition to a mixing vessel and employers should adhere to the NOHSC exposure standard for nuisance dust of 10 mg/m³;
- 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);
- Impermeable gloves should conform to AS/NZS 2161.2 (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. Spillage should be cleaned up promptly with an industrial vacuum cleaner for the polymer as imported or with absorbents if in the liquid formulation and 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.

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

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: D. W. Connell ed. Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton.

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

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

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

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, Sydney/Wellington.

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

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