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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Polymer in LUTOFAN DS 2335**

This Assessment has been compiled in accordance with the provisions of *the Industrial Chemicals (Notification and Assessment) Act 1989* and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by Worksafe Australia which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment, Sport, and Territories and the assessment of public health is conducted by the Department of Human Services and Health.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, Worksafe Australia, 92-94 Parramatta Road, Camperdown NSW 2050, between the hours of 10.00 a.m. and 12.00 noon and 2.00 p.m. and 4.00 p.m. each week day except on public holidays.

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Director  
Chemicals Notification and Assessment

## **FULL PUBLIC REPORT**

### **Polymer in LUTOFAN DS 2335**

#### **1. APPLICANT**

BASF Australia Ltd, 500 Princes Highway Noble Park Vic 3174.

#### **2. IDENTITY OF THE CHEMICAL**

Based on the nature of the chemical and the data provided, the notified polymer in LUTOFAN DS 2335, is considered to be non-hazardous. Therefore, the chemical name, CAS number, molecular formula, structural formula, molecular weight, spectral data and monomer composition have been exempted from publication in the Full Public Report and the Summary Report.

**Trade names:** LUTOFAN DS 2335 (proposed marketing name)

LUTOFAN DS 2292 (developmental name)

**Number-average molecular weight:** >1000

**Maximum percentage of low molecular weight species (molecular weight < 1000):** ~2

**Method of detection and determination:** The notified polymer may be detected and estimated by infrared spectroscopy.

#### **3. PHYSICAL AND CHEMICAL PROPERTIES**

The notified polymer will be available as a dispersion in water and will not be available in its isolated form. The following properties were therefore provided for the dispersion unless otherwise stipulated.

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

**pH:** 7-8

**Melting Point/Boiling Point:** ~100°C (water)

**Density:** 1110 kg/m<sup>3</sup>

**Vapour Pressure:** ~2.3 kPa at 20°C (water)

expected to be negligible for the polymer based on the structure of similar polymers

**Water Solubility:** polymer expected to be insoluble in water based on the structure of similar acrylates

**Partition Co-efficient****(n-octanol/water) log P<sub>O/W</sub>:**

not provided

**Adsorption/Desorption:**

the dispersion will become viscous and tacky as the water evaporates leaving the polymer bound to soil (binding dependent on the porosity and moisture content of the soil)

**Combustion Products:**

the dispersion will not burn due to the presence of water

possible combustion products for the dried polymer include carbon dioxide, carbon monoxide, water vapour, trace amounts of oxides of nitrogen and oxides of sulfur, hydrogen chloride and trace amounts of chlorine

**Explosive Properties:**

not expected to be explosive based on the structure of the polymer and the presence of water in the dispersion

**Comments on physico-chemical data:**

The hydrolysis of the polymer could not be determined because of insolubility in water. While it contains ester groups the notified substance is manufactured and stored as a dispersion in water and as such would not be expected to hydrolyse.

The partition coefficient was not determined as a polymer of this molecular size (NAMW >1000) is not expected to cross biological membranes.

The polymer is not adsorbed by soil. However, the dispersion being water based admixes with soil readily. As the water evaporates the dispersion becomes tacky and fixes to soil particles.

Dissociation constant measurements would be inapplicable as the notified substance is considered not soluble in water. It contains no readily dissociable groups.

Data on flash point, flammability limits and autoignition temperature were not applicable for the water based dispersion.

**4. PURITY OF THE CHEMICAL**

The notified chemical contains no hazardous impurities at levels necessary to classify it as a hazardous substance (1). Therefore, information on the purity of the polymer has been exempted from publication in the Full Public Report and the Summary Report.

**5. INDUSTRIAL USE**

The notified polymer will be imported into Australia as a 55% dispersion in water called LUTOFAN DS 2335. LUTOFAN DS 2335 will be used in industrial applications only. Major uses will be in bonding non-woven fabrics as well as for impregnating, coating and laminating non-woven, woven and knitted fabrics.

Import volumes are estimated at 100-1000 tonne/annum for the first five years.

## **6. OCCUPATIONAL EXPOSURE**

LUTOFAN DS 2335 will be imported in 20 tonne lots in *Flexibags* (flexible butyl rubber bags within a container), and transported by road to the customer in Kwinana Western Australia or to contract storage. Exposure of transport workers may occur in the event of a vehicle accident that results in damage to *Flexibag* containers and spill of product.

At the customer's textiles manufacturing plant, LUTOFAN DS 2335 will be discharged into a 60 tonne bulk storage tank. Each transfer operation will involve 2 personnel for 2 hours. These personnel will potentially be exposed during connection and disconnection of flexible piping between the pump and the flexible bag, estimated to be 15 minutes each transfer. From the bulk storage tank, LUTOFAN DS 2335 will be transferred through fixed pipe work to a sealed "day tank". Worker exposure should be negligible during the transfer operation.

The greatest potential for worker exposure will be during formulation of coating paste and during its application to textile surfaces. Three operators and a supervisor will be involved in the operation of the coating line. Coating paste will be formulated on a daily basis in open top drums on a floor mounted roller conveyor. LUTOFAN DS 2335, binder and colorant will be added to the drums, mixed with a wall mounted agitator and emptied into a vacuum particulate filter. The filtrate will be collected in open top drums. The drums will be wheeled on a trolley to the coating line area and the mixture passed through an in-line filter to the coating line. After the fabric has been coated it will be dried in a gas fired oven. Local exhaust ventilation will be employed at the sites of dispersion transfer into the paste drums, paste mixing, filtration and at the start of the coating line.

Operators may come in contact with the notified polymer during all open transfer operations, during cleaning of the filter equipment between batches (16 drums/day), whilst loading paste drums into a "drum washer" and during operation of the coating line (2220 hours/year/operator). The notifier has indicated that these workers will be required to wear protective clothing, safety glasses and PVC gloves.

Maintenance of the bulk storage tank and day tank will be conducted by contract workers experienced in tank cleaning.

## **7. PUBLIC EXPOSURE**

Only industrial use of the notified polymer will occur. The notified polymer is expected to have negligible vapour pressure and volatility and no public exposure is expected to occur during formulation of coating paste or application processes.

Public exposure resulting from disposal of any waste polymer by landfill or incineration is not expected to occur.

Public exposure to the notified polymer resulting from use or contact with 'end-use' products (eg. window furnishings) is expected to be minimal as when the treated fabric dries, an inert water soluble film is produced.

## **8. ENVIRONMENTAL EXPOSURE**

### **. Release**

There are several steps in the transport, storage mixing and application of the notified substance where release to the environment may occur.

The sea container enclosing the 20 tonne capacity *Flexibag* is transported from the dockside to the factory site by truck. Accident and spillage may occur along the route. The *Flexibag* as a

method of liquid transport has been in use for several years by the notifier without significant incidents or accidents. The container enclosing the bag acts as a bund in case of leakage during transport. There are methods available for sealing leaks in the *Flexibags* if they occur. The notifying company have been using the same specialist chemical carrying company for a number of years. The drivers are trained in accident response and proper handling of the loads they are carrying.

On the factory site the transfer from the *Flexibag* to the storage tank is carried out by pump and then from the storage tank to the day use tank in the factory again by pump through a fixed pipe system. The unloading area is within a containment that drains to a sump where water is allowed to evaporate and the solids are disposed to landfill as necessary. The resealed *Flexibag* is returned to the shipping agent for return to the polymer manufacturing plant.

In the factory the daily requirements of the notified substance are decanted into batch drums where binders and dyes are added. The batch is mixed and filtered, then pumped to the coating line for continuous application to the fabric for the period required to complete the batch. The area where mixing and application take place is protected from spillages by a collection and drainage system leading to the factory waste water treatment plant. Local exhaust ventilation is installed for use in the areas where the open topped batch drums are handled and the paste containing the notified polymer is applied to the fabric. The batch drums and coating line are washed for reuse at the end of each batch and wash water is collected and treated at the factory treatment plant where solids are collected, dried and disposed of at an approved landfill. Water from the waste treatment plant is discharged to land within the factory site. This practice is currently being licensed by the regulatory authorities who have stipulated waste water quality specifications for this release. No other release methods are envisaged as no other customers are anticipated.

The fabric coated with the notified substance is dried and fixed by a heating process with exhaust through an emission monitored smoke stack. Offcuts of treated fabric generated at the factory are disposed of to landfill.

The end use products (coated fabrics) containing the notified product are usually consigned to landfill at the end of their useful life.

## **. Fate**

The main environmental exposure arises from landfill disposal of recovered waste polymer from formulation and application processes within the factory.

The manufacturer states that the polymer in the water dispersion is not susceptible to breakdown in the environment. When the water is removed by evaporation the dispersion containing the polymer becomes viscous and tacky, binding to soil particles and becoming immobilised.

The polymer in the final use form as a cured coating on fabrics is impervious to breakdown and its fate is that of the fabricated article. Consignment to landfill is expected to be the main disposal method.

## **9. EVALUATION OF TOXICOLOGICAL DATA**

No toxicity data were provided for the notified polymer, which is acceptable for a synthetic polymer with number-average molecular weight (NAMW) > 1000 under *the Industrial Chemicals (Notification and Assessment) Act 1989*.

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

No ecotoxicological data were provided, which is acceptable for polymers of NAMW > 1000 according to the *Industrial Chemicals (Notification and Assessment) Act 1989*.

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

The polymer is unlikely to present a hazard to the environment when it is transported, stored, mixed, applied and fixed to fabrics in the manner described.

The polymer is also unlikely to be hazardous to aquatic organisms due to the end-use application and the polymer's high molecular weight.

The factory process waste and end use products (coated fabrics) containing the notified product are usually consigned to landfill at the end of their useful life, where the polymer is expected to remain immobile. Environmental hazard is expected to be low.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

The notified polymer in LUTOFAN DS 2335 has a NAMW of >1000 with ~2% low molecular weight species (MW<1000) and negligible levels of residual monomers. As a result of its high molecular weight the notified polymer is not expected to cross biological membranes and cause systemic effects.

The imported dispersion contains 55% of the notified polymer in water. The dispersion has no known hazardous physico-chemical properties. The major routes of exposure are expected to be via eye and skin contact. The proposed engineering controls and personal protective equipment should, however, result in minimal exposure to the polymer by these routes.

The dispersion will be diluted during the formulation of coating paste, thereby further reducing the potential for occupational exposure.

Under normal use conditions the polymer should not pose a significant health risk to workers.

While public contact with the notified polymer may be significant, exposure levels will be low. Therefore based on the above information it is considered that the notified polymer in LUTOFAN DS 2335 will not pose a significant hazard to public health when used in the proposed manner.

## **13. RECOMMENDATIONS**

To minimise occupational exposure to the polymer in LUTOFAN DS 2335 the following guidelines and precautions should be observed.

- . If engineering controls are insufficient to reduce exposure to a safe level, the following personal protection equipment should be worn :
  - . Goggles conforming to AS 1336 (2) and AS 1337 (3);
  - . PVC gloves conforming to AS 2161 (4); and
  - . Protective clothing conforming to AS 2919 (5).

- . Good work practices should be implemented to avoid spillages or splashings.
- . Any spillages should be promptly cleaned up and disposed according to local or state regulations.
- . Good personal hygiene practices, such as washing of hands prior to eating food, should be observed.
- . A copy of the Material Safety Data (MSDS) sheet for LUTOFAN DS 2335 or other products containing the notified polymer should be easily accessible to workers.

#### **14. MATERIAL SAFETY DATA SHEET**

The MSDS for LUTOFAN DS 2335 (Attachment 1) was provided in Worksafe Australia format (6). The MSDS was provided by BASF Australia Ltd as part of their notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of BASF Australia Ltd.

#### **15. REQUIREMENTS FOR SECONDARY NOTIFICATION**

Under the *Industrial Chemicals (Notification and Assessment) Act 1989*, secondary notification of the polymer in LUTOFAN DS 2335 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**

1. National Occupational Health and Safety Commission, *Approved Criteria for Classifying Hazardous Substances*, Australian Government Publishing Service Publ., Canberra, 1994.
2. Australian Standard 1336-1982 *Eye protection in the Industrial Environment*, Standard Association of Australia Publ., Sydney, 1982.
3. Australian Standard 1337-1984 *Eye Protectors for Industrial Applications*, Standards Association of Australia Publ., Sydney, 1984.
4. Australian Standard 2161-1978 *Industrial Safety Gloves and Mittens (excluding Electrical and Medical)*, Standards Association of Australia Publ., Sydney, 1978.
5. Australian Standard 2919-1987 *Industrial Clothing* Standards Association of Australia Publ., Sydney, 1987.
6. National Occupational Health and Safety Commission, *National Code of Practice for the Preparation of Material Safety Data Sheets*, Australian Government Publishing Service Publ., Canberra, 1994.