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March 2001

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

TEGO Protect 5000

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

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Director
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FULL PUBLIC REPORT**TEGO Protect 5000****1. APPLICANT**

International Sales and Marketing Pty Ltd of 55 Halstead Street, South Hurstville, NSW 2221 (ABN 36 467 259 314) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) **TEGO Protect 5000**.

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.

Marketing names: TEGO Protect 5000

Other names: Tegomer H-SI 2311

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition have been exempted from publication in the Full Public Report.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	Yellowish liquid	
Melting point	Not determined	
Density	0.96 g/cm ³ at 25°C	

Water solubility	Insoluble	
Vapour pressure	Not determined	Expected to be low as only low amounts of residual monomers are present.
Particle size	Not applicable	
Flash point	198°C	
Autoignition temperature	Not determined	
Explosive properties	Not determined	
Stability/reactivity	Decomposition is possible at pH <4 and >9.	

5.1 Comments on physical and chemical properties

None

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer will be used as a component of solvent-based industrial anti-graffiti coatings at 1-3%. The polymer will be in Part A of a 2-part system that is mixed immediately prior to use. The coatings may be applied by electrostatic or airless spray, brush or roller.

Manufacture/Import volume:

The polymer will be imported at a rate of 25 tonnes/year for the first 5 years.

Formulation details:

The notified polymer will be imported as a 100% concentrate in 20L plastic or 200 L steel drums. The formulation process will involve the addition of the polymer to anti-graffiti coatings in a closed system.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<i>Import and Storage</i>		
<i>Unpacking containers, palletising, labelling, rack storage (1-2 workers)</i>		
Dermal and/or	Possible skin/eye contamination	None specified

ocular if containers breached
accidentally

Formulation into Anti-graffiti Coating

Batch weighing, adding to mixing vessel (1-2 workers)

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes (100% polymer)	Extraction ventilation; safety glasses, protective gloves, overalls/dustcoat
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Lab testing (1-2 workers)

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes during sampling and analysis (100% and 1-3% notified polymer)	Extraction ventilation; safety glasses, protective gloves, dustcoat
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Packing into 20 L steel drums (1 worker)

Dermal and/or ocular	Possible skin/eye contamination if spillage occurs (1-3% notified polymer)	Extraction ventilation; enclosed filling; safety glasses, protective gloves, overalls/dustcoat
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End Use

Paint application – professional

Dermal, ocular, respiratory	Possible skin/eye contamination from spills and splashes during mixing, application and cleaning of brush, roller and spray equipment; possible inhalation exposure during spray application (1-3% notified polymer)	Overalls
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Disposal

Drum cleaning/recycling or disposal

Dermal	Possible skin contamination from spills and splashes during rinsing of drums (1-3% notified polymer)	None specified
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8. PUBLIC EXPOSURE

The imported polymer is for industrial use only. Once applied to the building surface, the coating is cured and not removable under normal circumstances. The notified polymer will remain as a cured resin and not be separately available for exposure or absorption.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

There is some potential for release of the polymer during anti-graffiti coating formulation which will take place at customer sites within Australia. Any spills that occur will be contained by the plant bunding.

The notifier indicated that up to 2% of the imported material (equivalent to 500 kg of the notified polymer) may be left in the 20 and 200 L drums after coating formulation. This would be either placed into landfill with the drums or, if the drums are recycled, would be removed with water or solvent and most likely sent to on site effluent treatment facilities where solid material (including the notified polymer) would become incorporated into waste sludge. The sludge would be either incinerated or sent to landfill.

Further losses from spills and leaks are possible when the polymer concentrate is incorporated into coatings, with losses estimated at a maximum of 1% (250 kg of polymer each year). These losses would be contained within plant bunding and sent to on site treatment where the polymer would associate with sludge and be disposed of by incineration or into landfill.

Further losses from splashes, residuals left in containers and other sources are also inevitable during final use of the coatings. These are difficult to quantify but assuming (as a worst case) that 10% is lost in this manner, a further loss of up to 2.5 tonnes per annum is possible. However, release will be widespread throughout Australia, and at low levels.

9.2. Fate

Once applied to the intended surfaces, the polyurethane coating protects the substrate from graffiti. The notified polymer will be incorporated into the polyurethane polymer matrix and not released in its raw state, therefore not presenting an environmental hazard.

The cured coating is not removable under normal circumstances and is not damaged by high pressure cleaning. The coating will enter the environment when the substrate is sacrificed by abrasion or demolished and disposed of in a landfill.

Solid waste generated in the formulation and application of the coating is also expected to be disposed of to landfill. If incinerated the polymer will be destroyed with production of water and oxides of carbon and silica.

No quantitative biodegradation data was provided, but polymer placed into landfill is expected to partition into the soil compartment due to its insolubility and mineralise to CO₂ and silicate through slow biological and abiotic processes. Related studies have determined that degradation is inhibited by soil moisture. However, in dry soils breakdown is rapid to form low molecular weight, soluble fractions which are quickly degraded to silicate.

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

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

None of the polymer constituents or residual monomers are listed as hazardous substances according to the NOHSC *List of Designated Hazardous Substances* (NOHSC 1999a) or have exposure standards according to the NOHSC *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* (NOHSC 1995).

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

The environmental hazard from use of the new polymer in anti-graffiti coatings is assessed as low. Some release of the polymer during the coating formulation is expected (approximately 750 kg maximum per year), and this will be placed into landfill. Up to 10% of the polymer (2.5 tonnes per annum) may also be lost during coating application and most of this is expected to enter the soil compartment. However, this release will be widespread and at low levels.

Upon abrasion or demolition of the coated substrate, the coating containing the polymer will be placed into landfill. In a landfill or in soil the polymer will be slowly degraded through biological and abiotic processes with formation of water, CO₂ and silicate.

Given the above, environmental exposure and the overall environmental hazard is expected to be low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological data were provided for the notified polymer so it cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC 1999b). However, given that it meets criteria for a Polymer of Low Concern, it is unlikely to be classified hazardous in accordance with NOHSC (1999b).

13.2. Occupational health and safety

During formulation of the anti-graffiti coating, the main routes of exposure to the notified polymer would be dermal and ocular. Due to the expected low vapour pressure and extraction ventilation, inhalation exposure is considered unlikely. Initial formulation into the anti-graffiti coatings and disposal of polymer containers would present the greatest possibility of exposure as workers will handle the undiluted 100% polymer solution. Laboratory testing provides the possibility of exposure to both undiluted and diluted polymer. Dermal and ocular exposure to the notified polymer is possible during application of the anti-graffiti coating but

would be low as the polymer is diluted to 1-3% with other paint components. Once the coating is cured, the notified polymer is not available for absorption and is not normally removable from the substrate.

Workers who will handle the polymer during formulation will wear personal protective equipment consisting of safety glasses, protective gloves and overalls or dustcoat. These exposure controls will be employed to provide protection not only against exposure to the notified polymer but also to other hazardous solvents and constituents of the paint coating. These exposure controls combined with a low likely toxicological impact renders the health risk from the notified polymer for these formulation workers low.

During end-use, in addition to dermal and ocular exposure during application and cleaning of equipment, inhalation exposure to the notified polymer is possible if applied by spray. It is likely that less control over exposure will occur during application compared to initial formulation. Personal exposure protection is likely to consist of overalls and possibly negative pressure respirators. Given the low toxicological profile for the notified polymer, the health risk for these end-users is low.

However during end-use, protection against dermal, ocular and inhalation exposure to the paint coating is essential to account for the hazardous solvents and components of the coating. The anti-graffiti coating should be applied in accordance with the NOHSC *Spray Painting National Guidance Material* (NOHSC 1999c).

TEGO Protect 5000 is of low concern to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

Based on low toxicity and public exposure, TEGO Protect 5000 is considered not to pose a significant risk to public health when used in the proposed manner.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

No special precautions are required for TEGO Protect 5000. However, because of the presence of additional hazardous solvents and components in the anti-graffitti coating, the following guidelines and precautions should be observed:

- Protective eyewear, chemical resistant industrial clothing and footwear, impermeable gloves and a negative pressure respirator should be used during occupational use of the products containing the notified polymer;
- The coating containing the notified polymer should be applied in accordance with the NOHSC Spray Painting National Guidance Material (NOHSC, 1999c);
- Spillage of the notified polymer should be cleaned up promptly with absorbents and 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, 1999b), workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Guidance in selection of protective eyewear 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 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161.2 (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) and other internationally acceptable standards.

16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

- (i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of (the notified chemical) becomes aware of any of these circumstances, they must notify the Director within 28 days; or
- (ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

17. REFERENCES

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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.

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

Standards Australia/Standards New Zealand (1994c) Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices. 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.

Website Document Details

NICNAS Website Page

PLC/170

INDEX and KEY WORDS

Chemical	Number	Use	H/ND	Date
TEGO Protect 5000	PLC/170	Surface coatings	Not determined to be hazardous	March 2001

Title	TEGO Protect 5000
Subject	TEGO Protect 5000
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