

File No: PLC/169

March 2001

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

TEGO Dispers 750W

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 Dispers 750W****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 Dispers 750W**.

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 Dispers 750W

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. Although the polymer is cationic, the FGEW for an amine group present is greater than 5000. The presence of additional high concern groups is not relevant in this case as the NAMW of the notified polymer is greater than 10,000.

5. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is manufactured as a 40% aqueous solution. The properties listed below are for the polymer solution.

Property	Result	Comments
Appearance	Amber coloured liquid	

Melting point	Not determined	
Density	1.075 g/cm ³ at 25°C	
Water solubility	Soluble	See comments below
Vapour pressure	2.5 kPa at 20°C	
Flammability	Not determined	
Autoignition temperature	Not determined	
Explosive properties	Not explosive	
Stability/reactivity	Stable	

5.1 Comments on physical and chemical properties

The polymer has a high molecular weight and is dispersible in water in high concentration due to ionic groups attached to the polymer backbone. The pH of the polymer solution is 6-7.

6. USE, VOLUME AND FORMULATION

Use:

The polymer will be employed as a wetting and dispersant additive for aqueous pigment concentrates used by colour concentrate and surface coating producers such as paint and ink manufacturers. The concentrate formulation process involves the blending of TEGO Dispers 750W with other components such as pigments, glycols, defoamers, and surfactants by high speed stirring in an open vessel and then circulation through a horizontal bead mill.

The proportion of the polymer contained in final products will be as follows:

Colour concentrates:	5-30% in inorganic pigment 20-70% in organic pigment 40-120% in carbon black
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Coating systems (paints):	0.5-2.0%
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Manufacture/Import volume:

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

Formulation details:

The notified polymer will be imported in 20 L and 200 L steel drums as a 40% aqueous solution.

7. OCCUPATIONAL EXPOSURE

Exposure route

Exposure details

Controls indicated by notifier

Import and Storage

Unpacking containers, palletising, labelling, rack storage (3 workers)

Dermal and/or ocular	Possible skin/eye contamination if containers breached accidentally	None specified
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Formulation into Pigment Dispersion Additive

Batch weighing, adding to mixing pots, bead milling (1-2 workers)

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes (40% notified polymer)	Good ventilation; safety glasses, protective gloves, overalls/dustcoat
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Lab testing (1 worker)

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes during sampling and analysis (40% and 4% notified polymer)	Good ventilation; safety glasses, protective gloves, dustcoat
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Packing into 20 or 30 L plastic containers (1 worker)

Dermal and/or ocular	Possible skin/eye contamination if spillage occurs (4% notified polymer)	Good ventilation; safety glasses, protective gloves, overalls/dustcoat
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Formulation of Surface Coatings and Inks

Adding pigment dispersions to emulsions, paints and inks

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes during weighing and transfer (4% notified polymer)	Safety glasses, protective gloves, overalls
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Packing

Dermal and/or ocular	Possible skin/eye contamination if spillage occurs (0.04-0.12% notified polymer)	Safety glasses, protective gloves, overalls/dustcoat
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End use

Paint application – professional and DIY

Dermal and/or ocular	Possible skin/eye contamination from spills and splashes during mixing, application and cleaning of equipment (0.04-0.12% notified polymer)	Overalls
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Disposal

Drum cleaning/recycling or disposal

Dermal	Possible skin contamination from spills and splashes during	None specified
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8. PUBLIC EXPOSURE

The imported product and formulated pigment dispersions are for industrial use only and the final paint products are expected to be used by professional painters and DIY painters. The public will come into contact with painted articles, including masonry, plasterboard and timber. However, after application, the polymer in low concentration in paint becomes a stable part of the cured resin and will not be available for absorption by biological membranes. Therefore, the potential for public exposure to the notified polymer is considered to be very low.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

There is some potential for release of the polymer during the formulation of pigment dispersions and during manufacture of paints, inks and other coatings, which will take place at customer sites within Australia. Spills 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 concentrate formulation. This would be either placed into landfill with the drums or, if the drums are recycled, 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 pigment dispersions are formulated into paints and 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 tins and other sources are also inevitable during final use of the paints and coatings. These are difficult to quantify, however, assuming (as a worst case) that 10% is lost in this manner, then a further loss of up to 2.5 tonnes per annum is possible. Release will be widespread throughout Australia, and at low levels.

9.2. Fate

Once applied to the intended surfaces as a paint, the notified polymer will be incorporated in a hard, durable, inert film and would not present an environmental hazard. The ultimate fate will be industrial landfill or incineration.

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 nitrogen.

No quantitative biodegradation data was provided, but if placed into landfill the polymer is expected to be mineralised to CO₂ and nitrate or ammonia through slow biological and abiotic processes.

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

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

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 paints and coatings is assessed as low. Some release of the polymer during pigment dispersion preparation and in paint 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 paint application and most of this is expected to enter the soil compartment. However, this release will be widespread and at low levels.

At the end of their useful lives, articles coated with paint containing the polymer would be incinerated or placed into landfill. In landfill or in soil the polymer will be slowly degraded through biological and abiotic processes with formation of water, CO₂ and nitrate. Incineration would also destroy the polymer, with production of water and oxides of carbon and nitrogen.

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).

Three of the monomers are hazardous substances and two have NOHSC exposure standards. However, monomer levels were undetectable.

13.2. Occupational health and safety

The main route of exposure to the notified polymer would be dermal and ocular. Due to the moderate vapour pressure and good ventilation, inhalation exposure is considered unlikely. Initial formulation into pigment dispersion and disposal of polymer containers would present the greatest possibility of exposure as workers will handle the undiluted 40% aqueous polymer solution. Laboratory testing provides the possibility of exposure to both undiluted and diluted polymer solution. Exposure is less likely after formulation, packing, incorporation into paint and inks and then end-use as the polymer is diluted with other coating components. Once the paints and inks are cured, the notified polymer is not available for absorption.

Workers who handle the polymer during formulation into pigment dispersions, paints and inks 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 solvents and constituents of the dispersant solution and paint. These exposure controls combined with a low likely toxicological impact renders the health risk from the notified polymer for these formulation workers low.

Less control over exposure will occur with paint application by professional or DIY painters. Personal exposure protection is likely to consist of overalls and, in the case of spray application, a disposable mask. Despite this, the low toxicological profile for the notified polymer renders the health risk for these end-users low.

TEGO Dispers 750W 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 Dispers 750W 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 Dispers 750W. However, in the interests of good occupational health and safety, the following guidelines and precautions should be observed:

- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves should be used during occupational use of the products containing the notified polymer;
- 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

Connell D. W. (1990) General characteristics of organic compounds which exhibit bioaccumulation. In Connell D. W., (Ed) *Bioaccumulation of Xenobiotic Compounds*. CRC Press, Boca Raton, USA.

National Occupational Health and Safety Commission (1994a) 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 (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(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: Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999a) List of Designated Hazardous Substances [NOHSC:10005(1999)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999b) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1994)]. Australian Government Publishing Service, Canberra.

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

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/169

INDEX and KEY WORDS

Chemical	Number	Use	H/ND	Date
TEGO Dispers 750W	PLC/169	Surface coatings	Not determined to be hazardous	March 2001

Title	TEGO Dispers 750W
Subject	TEGO Dispers 750W
Author	NICNAS
Keywords	March 2001, International Sales and Marketing Pty Ltd, 225367-02-2, The polymer will be employed as a wetting and dispersant additive for aqueous pigment concentrates used by colour concentrate and surface coating producers such as paint and ink manufacturers.