

File No: LTD/1208

28 February 2006

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

FULL PUBLIC REPORT

Liquitint® Red MX

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**Director
NICNAS**

FULL PUBLIC REPORT

Liquitint® Red MX

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Walk Off Mats Asia Pacific P/L, ABN: 14 002 708 830
U7/95 O'Sullivan Beach Rd., Lonsdale
South Australia, 5160

and

Albright & Wilson, ABN: 36 004 234 137
22 Davis Rd, Wetherill Park,
New South Wales, 2164

NOTIFICATION CATEGORY

Limited: Polymer with NAMW \geq 1000 (greater than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name

Other Name

CAS Number

Molecular Formula

Structural Formula

Molecular Weight (NAMW and WAMW)

Spectral Data

Composition

Import Volume

Use Details

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Vapour Pressure

Water solubility

Adsorption/Desorption

Particle Size

Flammability Limits

Autoignition Temperature

Explosive Properties

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

United States TSCA (1987)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Liquitint® Red MX

3. COMPOSITION

DEGREE OF PURITY
High

ADDITIVES/ADJUVANTS
None

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

The notified polymer will be imported as a liquid (<30% notified polymer) by sea in 18 kg high-density polyethylene pails or 210 L drums.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	< 1	<1	< 1	< 1	< 1

USE

The notified chemical will be used as a colorant (<1% notified chemical) in industrial and household cleaners.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
Sydney, New South Wales or Melbourne, Victoria

IDENTITY OF RECIPIENTS
The product containing the notified chemical will be warehoused at site(s) located in Sydney New South Wales.

TRANSPORTATION AND PACKAGING
The imported liquid product Liquitint® Red MX (<30% notified chemical) will be imported in 18 kg high density polyethylene pails or 210 L drums and transported by road to the warehouse(s) for storage until required. The end-use products (<1% notified chemical) will be typically transported in by road in 1–2 L plastic containers to retail outlets and industrial users Australia-wide.

5.2. Operation description

The notified chemical is not manufactured in Australia. Blending or packaging of the product containing the notified chemical occurs in Australia. Retail workers will handle the finished products containing the notified chemical.

Blending and packing

The 20 L pails or 210 L drums of liquid product containing the notified chemical (up to 30%) will be transported by forklift or manually as required from the warehouse to the production area. At the blending plant the imported liquid product containing the notified chemical is transferred manually from the drum to the blending tank. This is typically achieved by manually opening the drum and measuring out the product containing the notified chemical. In some operations this may occur by automated means whereby by the drum is lanced and the contents automatically transferred by transfer lines to the blending tank. During the blending process, the product containing the notified chemical is pumped automatically through to the blending tank (closed system) to formulate a variety of cleaning products that contains the notified chemical (<1%). The end-use products containing the notified chemical are characteristically packed by means of automated and enclosed filling systems into 1–2 L plastic containers.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Transport	unknown	unknown	< once per week
Warehouse and Storage	5	0.5 hour	once per week
Reformulation (Blending)	10	8 hours per day	50 days per year
Maintenance and Cleaning	5	< 8 hours per day	< 50 days per year
Quality Control	0	0	0

Exposure Details

Transport and warehousing

Transport, warehouse and stores personnel will wear protective equipment (overalls/ industrial clothing and gloves as appropriate) when receiving and handling consignments of the imported product containing the notified chemical (<30% notified chemical). The product will be handled in the warehouse by forklift handling of pails or drums or manual handling of individual packages. During transport and warehousing, workers are unlikely to be exposed to the notified chemical except when packaging is accidentally breached.

Blending and packing

The main routes of exposure to the notified chemical (<30% notified chemical) are dermal and accidental ocular exposure during manual measuring and transferring of the imported product) to the blending tank.

It is possible that dermal and accidental ocular exposure may also occur if manual intervention is required during the automated blending and packaging operations and if the packaging is accidentally breached. Maintenance workers will have intermittent dermal and the potential for accidental ocular exposure to the notified chemical when performing maintenance/cleaning of the equipment in general.

All workers involved in handling the imported product and blended product will wear personal protective equipment (PPE) such as safety glasses, safety boots, PVC/latex gloves, protective clothing, if necessary. The blending operations occur in a closed system under local exhaust ventilation (LVE). All production operators are trained in the appropriate operational procedures and precautions. All workers have access to the MSDS.

Once the formulated cleaning products are packaged for distribution, no further worker exposure is expected except when packaging is accidentally breached.

End-use

While the notifier gives no details, it is estimated that a large number of retail and cleaning workers may potentially be exposed to the notified chemical (<1%) by means of end-use cleaning products. Such exposure may include spray-cleaning products that have the potential to form aerosols. It is expected that use of the end-use products by cleaning workers would be similar (albeit more frequent) to the pattern of public exposure. The level of PPE used by cleaning workers is likely to vary and would include gloves in a number of cases.

Retail workers would only be exposed to the notified chemical (<1%) in the case of inadvertent breach of the packaging. In the event of an accident, spills will be removed in accordance with the manufacturers instructions.

5.4. Release

RELEASE OF CHEMICAL AT SITE

The notified chemical is manufactured overseas and will be imported and transported by road to the distributor(s). From here, it is then transported to the reformulation site, again by road. During the transport and handling operations, only accidental release through mishap is expected. Any spilt notified chemical is expected to be physically contained, collected and subsequently disposed of to secure landfill.

At the reformulation site, the notified chemical is removed from the import containers and held in a

storage tank. The import containers are then rinsed, with water and the rinsate will be emptied into the storage container, also. Rinsed import containers, with negligible residual notified chemical are then expected to be disposed of to secure landfill.

From the storage tank, the notified chemical is then fed into a closed mixer/blender and incorporated with other ingredients. From here it is subsequently bottled using an automatic filling machine. Release to the environment may occur at this time from the unlikely event of spills and from the routine cleaning and maintenance operations. Large spills are expected to be contained by standard physical engineering means, and collected using absorbent pads, which would then be disposed of to secure landfill. Small spills and releases from equipment cleaning and maintenance operations are expected to be disposed of to sewer as trade waste.

RELEASE OF CHEMICAL FROM USE

The notified chemical is proposed to be used primarily as a colourant in household and industrial cleaners. As such, it is expected that apart from the very small quantity that is disposed of to landfill, as residual in containers or from major spills, effectively the entire quantity of imported notified chemical will be disposed of after use to sewer.

5.5. Disposal

The major route for disposal of the notified chemical will be to the sewer after use. A very small proportion of the total imported quantity is expected to be disposed of to landfill, as residual in containers.

5.6. Public exposure

The notified chemical will be incorporated into household cleaning products at up to 1% that will be used widely by consumers. There is the potential for low level albeit regular dermal and accidental ocular contact by the public with the notified chemical during use of cleaning products. This may include products used in spray bottles leading to potential aerosol formation.

There could be incidental dermal exposure to detergent liquid itself through splashes or contamination of the outside of the packaging. Dermal exposure may also occur through inadvertent use of products to wash hands. Inhalation exposure is considered unlikely either from the cleaning products or from water containing it as the notified chemical has low volatility and aerosols are unlikely to form due to the typical high viscosity of the intended cleaning products.

Oral exposure could occur from residues of the cleaning products if used to wash food containers and utensils and if these articles are not rinsed after washing. It is expected that residues would be low, and transfer to ingested food would be even lower. Accidental oral exposure of young children to cleaning products is also possible.

It is expected that some consumers would wear gloves for certain cleaning tasks while others would not. However, exposure to the notified chemical will be minimized by the low concentration (<1%) of the notified chemical in the consumer products.

The public would only be exposed to concentrations up to 30% notified chemical in the event of an accident during transport involving extensive breakage of the imported product.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa Dark red liquid with a faint vinegar-like odour

Freezing Point -28°C

METHOD	OECD TG 102 Melting Point/Melting Range.
	EC Directive 92/69/EEC A.1 Melting/Freezing Temperature.
Remarks	No protocol deviations reported.
TEST FACILITY	Milliken Chemical (2005)

Boiling Point 110°C at 101.3 kPa

METHOD OECD TG 103 Boiling Point.
EC Directive 92/69/EEC A.2 Boiling Temperature.
Remarks No protocol deviations reported.
TEST FACILITY Milliken Chemical (2005)

Density 1.04 kg/m³ at 20 °C

METHOD OECD TG 109 Density of Liquids and Solids.
EC Directive 92/69/EEC A.3 Relative Density.
Remarks No protocol deviations reported. .
TEST FACILITY Milliken Chemical (2005)

Vapour Pressure Not determined
Remarks Predicted to be low based on relatively high molecular weight and cationic functionality.

Water Solubility Completely soluble in water
Remarks No test result has been provided. The notified chemical is imported as a solution with 10% water and 70% propylene glycol, as listed in the MSDS, and reported as completely soluble. The presence of propylene glycol will influence solubility in the imported solution. The notifier provided a modelled result using WSKOW v 1.41 using a log Kow = -3.99, giving a water solubility of 17.95 mg/L, with the estimate using fragments being 26.3 mg/L. Further modelling done by the Department of the Environment and Heritage, using the experimental log Pow = -0.22, as reported below, and using Kenaga and Goring's regression equation in Lyman *et al* (1990), results in a water solubility of 24465 mg/L, indicating high variability in model results.

Hydrolysis as a Function of pH

METHOD OECD TG 111 Hydrolysis as a Function of pH.

<i>pH</i>	<i>T (°C)</i>	<i>t</i> _{1/2} <i>hours</i>
4	30	3062
7	30	416
9	30	79 (~3.5 d)
4	40	6945
7	40	152
9	40	32

Remarks At a pH of 9.0 at 50°C, the notified chemical hydrolysed in less than one week. Therefore, reduced temperatures (30-40°C) were used for analysis. The notified chemical was observed to hydrolyse at 30°C by 50% at 3062, 416 and 79 hours at pH 4, 7 and 9, respectively. The notified chemical was observed to hydrolyse at 40°C by 50% at 6945, 152 and 32 hours at pH 4, 7 and 9, respectively. The test appears to have been performed satisfactorily to the standards set by the test guidelines.

TEST FACILITY Milliken Chemical (2004a)

Partition Coefficient (n-octanol/water) Pow = 0.60 at 20°C and log Pow = -0.22 at 20°C

METHOD OPPTS 830.7550, Partition Coefficient (n-Octanol/Water), Shake Flask Method.
Remarks Analysed spectrophotometrically. Brief details provided.
TEST FACILITY Milliken Chemical (2004b)

Adsorption/Desorption log K_{oc} = 10.832 (Estimated)

METHOD Estimated using QSAR. (Note qualifications above.)
TEST FACILITY PCKOWIN V 1.66 US EPA.

Dissociation Constant Expected to be completely dissociated throughout the environmental pH range of 4-9.

Remarks The notified chemical is an aqueous solution of a salt.

Particle Size

Remarks Test not conducted. The notified chemical is a liquid.

Flash Point

115°C

METHOD Determined using Cleveland open flash cup apparatus.

Remarks No protocol deviations reported.

TEST FACILITY Milliken Chemical (2005)

Flammability Limits

Remarks Test not conducted. The notified chemical is imported only as an aqueous solution.

Autoignition Temperature

Remarks Test not conducted. The notified chemical is imported only as an aqueous solution.

Explosive Properties

Remarks Test not conducted. There are no chemical groups that would infer explosive properties. Hence the result has been predicted negative by expert determination.

Reactivity

The notified chemical is stable under normal conditions of use

Remarks None

7. TOXICOLOGICAL INVESTIGATIONS

<i>Endpoint and Result</i>	<i>Assessment Conclusion</i>
Rabbit, eye irritation	slightly irritating
Guinea pig, skin sensitisation – adjuvant test	no evidence of sensitisation
Genotoxicity – bacterial reverse mutation	non mutagenic

7.1. Irritation – eye

TEST SUBSTANCE Analogue (details are claimed exempt from publication)

METHOD OPPTS 798.4500 Primary Eye Irritation.
(equivalent to OECD TG 405 Acute Eye Irritation/Corrosion)

Species/Strain Rabbit/New Zealand White

Number of Animals 6

Observation Period 7 days

Remarks - Method No significant protocol deviations.

RESULTS

<i>Lesion</i>	<i>Mean Score*</i>	<i>Maximum Value</i>	<i>Maximum Duration of Any Effect</i>	<i>Maximum Value at End of Observation Period</i>
<i>Conjunctiva: redness</i>	1.8	2	4 days	0
<i>Conjunctiva: chemosis</i>	0.7	3	72 hrs	0
<i>Conjunctiva: discharge</i>	0.8	3	72 hrs	0
<i>Corneal opacity</i>	0.6	1	72 hrs	0
<i>Iridial inflammation</i>	0.1	1	24 hrs	0

*Calculated on the basis of the scores at 24, 48, and 72 hours for ALL animals.

Remarks - Results Corneal opacity (grade 1) was observed in four animals at the 24 and 48 h

intervals and persisted in three animals to the 72 h interval. Iritis (grade 1) was noted in three animals at the 1 h interval and persisted in two animals at 24 h. Conjunctival redness (grades 1-2) appeared in all the animals from the 1 h interval to the 72 h interval, and continued in five animals at days 4. Chemosis (grades 1-3) was observed in all the animals at the 1 h interval then subsided to a grade 1 in four animals, and a grade 2 in one animal at 24 h. Chemosis (grade 1) was noted in four animals at 48 h and three animals at the 72 h interval. Discharge (grades 1-3) appeared in all animals at the 1 and 24 h interval, and in three animals at 48 h and one animal at 72 h. All eye irritation cleared by Day 7. Excessive rubbing and blinking were observed in three animals upon instillation of the test substance. Based on these results, the study concluded that the test analogue was an eye irritant.

CONCLUSION The notified chemical is irritating to the eye but not classifiable under the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

TEST FACILITY Hazleton (1987)

7.2. Skin sensitisation

TEST SUBSTANCE 21% notified chemical (aqueous solution)

METHOD OECD TG 406 Skin Sensitisation - Magnusson and Kligman Method.
EC Directive 96/54/EC B.6 Skin Sensitisation - Skin sensitisation.

Species/Strain Guinea pig/ Dunkin-Hartley
PRELIMINARY STUDY Maximum Non-irritating Concentration:
intradermal: 1% v/v (as supplied)
topical: as supplied

MAIN STUDY
Number of Animals Test Group: 10 Control Group: 5
INDUCTION PHASE Induction Concentration:

intradermal: 1% v/v (as supplied)
topical: as supplied
Signs of Irritation Nil. Red staining on dose site did not interfere with scoring.

CHALLENGE PHASE
1st challenge topical: as supplied and 50% v/v (as supplied)
Remarks - Method Statement of GLP. No protocol deviation reported.

RESULTS

Animal	Challenge Concentration	Number of Animals Showing Skin Reactions after	
		1 st challenge ⁺	
		24 h	48 h
Test Group	21%	0/10	0/10
	10.5%	0/10	0/10
Control Group	21%	0/5	0/5
	10.5%	0/5	0/5

⁺ Results based on test substance.

Remarks - Results There were no deaths and no signs of ill health or toxicity were observed over the period of the study. During intradermal injection induction, no irritation was seen in test animals at sites receiving 1% v/v (as supplied) and no irritation in control animals. During topical induction, no erythema was observed in test animals following treatment of the test material (as supplied) or in the control group. During dermal challenge, there were no dermal reactions seen in any of the test or control animals.

CONCLUSION	There was no evidence of reactions indicative of skin sensitisation to the notified chemical under the conditions of the test.
TEST FACILITY	Huntingdon Life Sciences Ltd (2002b)

7.3. Genotoxicity – bacteria

TEST SUBSTANCE	21% notified chemical (aqueous solution)
METHOD	OECD TG 471 Bacterial Reverse Mutation Test. EC Directive 2000/32/EC B.13/14 Mutagenicity – Reverse Mutation Test using Bacteria. Plate incorporation procedure/Pre incubation procedure Species/Strain <i>S. typhimurium</i> : TA1535, TA1537, TA98, TA100 <i>E. coli</i> : WP2uvrA (pKM101) Metabolic Activation System Concentration Range in Main Test Vehicle Remarks - Method
	Aroclor 1254-induced rats (S9 mix) a) With metabolic activation: 50-5000 µg/plate b) Without metabolic activation: 50-5000 µg/plate water Statement of GLP. No protocol deviations reported.

RESULTS

<i>Metabolic Activation</i>	<i>Test Substance Concentration⁺ (µg/plate) Resulting in:</i>			
	<i>Cytotoxicity in Preliminary Test</i>	<i>Cytotoxicity in Main Test</i>	<i>Precipitation</i>	<i>Genotoxic Effect</i>
<i>Absent</i>				
Test 1	>5000	>5000	>5000	Negative
Test 2	>5000	>5000	>5000	Negative
<i>Present</i>				
Test 1	>5000	>5000	>5000	Negative
Test 2	>5000	>5000	>5000	Negative

⁺ Results based test substance.

Remarks - Results	<p>The vehicle control plates gave counts of revertant colonies generally within the normal range. All of the positive control chemicals used in the test induced marked increases in the frequency of the revertant colonies, both with and without metabolic activation. Thus, the sensitivity of the assay and the efficacy of the S-9 mix were validated.</p> <p>The test material caused no visible reduction in the growth of the bacterial background lawn at any dose level. The test material, therefore, was tested up to a maximum dose level of 5000 µg/plate.</p> <p>No test material precipitate was observed on the plates at any dose treated in either the presence or absence of the S-9 mix. No significant increases in the frequency of revertant colonies were recorded for any of the bacterial strains with any dose of the test material either with or without metabolic activation</p>
CONCLUSION	The notified chemical was not mutagenic to bacteria under the conditions of the test.
TEST FACILITY	Huntingdon Life Sciences Ltd (2002c)

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted. It is assumed that the notified chemical will not be readily biodegradable.

8.2. Ecotoxicological investigations

8.2.1. Acute toxicity to fish

TEST SUBSTANCE	Notified chemical.
METHOD	OECD TG 203 Fish, Acute Toxicity Test – Semi-static; and EC Directive 92/69/EEC C.1 Acute Toxicity for Fish – Semi-static.
Species	Rainbow Trout (<i>Oncorhynchus mykiss</i>)
Exposure Period	96 h
Auxiliary Solvent	Nil
Water Hardness	137-155 mg CaCO ₃ /L
Analytical Monitoring	UV/Vis
Remarks – Method	The test substance was dissolved in diluent water to give test solutions with a range of concentrations. These test concentrations were verified by chemical analysis. Environmental parameters (pH, T°C and mg O ₂ /L) remained within acceptable limits throughout the study. The imported formulation was tested, while concentrations are reported for the notified chemical.

RESULTS

Concentration mg/L		Number of Fish	Mortality				
Nominal	Actual		1 h	24 h	48 h	72 h	96 h
0	0	7	0	0	0	0	0
4.6	4.2	7	0	0	0	0	0
10	9.5	7	0	0	0	0	0
22	21	7	0	0	0	0	0
46	45	7	0	0	0	0	0
100	96	7	0	0	0	0	0

LC50	>100 mg/L at 96 hours.
NOEC	22 mg/L at 96 hours.
Remarks – Results	Marked reactions to exposure (other than death) were increased pigmentation, occurring after 2 hours at the 45 and 96 mg/L concentrations, and hyperventilating occurring for the first 4 hours at the 96 mg/L concentration.

CONCLUSION	The notified chemical was determined to be very slightly toxic under strict conditions of the test.
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TEST FACILITY	Huntingdon Life Sciences Ltd (2002a)
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9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified chemical will be imported into Sydney, where it will be reformulated with other ingredients to form household and industrial cleaners, of which the notified chemical is a colourant. Nearly all of the notified chemical will be disposed of to sewer after use, with only small quantities, including that proportion remaining as residual in containers and from major spills, being disposed of to landfill.

In sewer, the notified chemical is expected to associate with suspended particles and sediment. In landfill, the notified chemical is not expected to be mobile and should adsorb to sediment, where over time it should slowly degrade through biotic and abiotic processes to simple carbon

and nitrogen-based compounds.

Based on the worst-case scenario of 100% notified chemical being released to the aquatic environment via the sewer, with nil removal, a predicted environmental concentrations (PECs) of the notified chemical have been calculated:

Amount entering sewer per year	1000 kg
Number of days per year	365
National population	20.1 million
Litres per person	200 L
PEC _{River}	0.682 µg/L.
PEC _{Ocean}	0.068 µg/L.

STP effluent re-use for irrigation occurs throughout Australia. The agricultural irrigation application rate is assumed to be 1000 L/m²/year (10 ML/ha/yr). The notified chemical in this volume is assumed to infiltrate and accumulate in the top 0.1 m of soil (density 1000 kg/m³). Using these assumptions, irrigation with a concentration of 0.682 µg/L may potentially result in a soil concentration of approximately 6.82 µg/kg. Assuming accumulation of the notified chemical in soil for 5 and 10 years under repeated irrigation, the concentration of notified chemical in the applied soil in 5 and 10 years may be approximately 0.03 and 0.07 mg/kg respectively.

The potential for the notified chemical to bioaccumulate is low due to its level of water solubility and will be limited due to the diffused release to sewer Australia wide.

9.1.2. Environment – effects assessment

The results of the ecotoxicological studies indicate that the notified chemical is slightly toxic to fish (96 h LC50 >100 mg/L). A PNEC has therefore, been calculated based on the single reported end point (100 mg/L) using a safety factor of 1000, resulting in PNEC >100 µg/L.

9.1.3. Environment – risk characterisation

The Risk quotient (RQ) values, where $RQ = PEC/PNEC$, for freshwater and marine receiving environments have been calculated for the “worst case” scenario, as shown in the table below.

Worst Case: PNEC & 0% Removal	PEC	PNEC	RQ
River	0.682	>100 µg/L	<0.0068
Marine	0.068	>100 µg/L	<0.0007

As the RQ for both river and marine receiving waters are significantly below 1.0, the proposed diffuse use of the notified chemical, at current expected import volumes, is unlikely to pose an unacceptable risk to the aquatic environment. Also, this doesn't take into account adsorption to sludge which based on literature (Boethling RS and Nabholz JV, 1997) will be in the order of 90%.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Skin contact will be the main route of exposure although eye contact by means of inadvertent splashes is also possible. Given the molecular weight range of the notified chemical, absorption through intact skin is not expected to be significant. The notified chemical is a non-volatile chemical liquid consequently inhalation exposure is not expected.

Transport, Warehouse and Storage

The notified chemical is imported as a solution (<30% notified chemical) in high-density polyethylene pails and steel drums and is warehoused at distributor(s) prior to supply to manufacturer(s) as required. Consequently, exposure to the notified chemical (<30% notified chemical) is not expected during transport, warehousing and storage provided the pails and drums containing the imported product remain intact.

Blending and packaging

Due to the largely automated, controlled and enclosed nature of the blending and packaging process, minimal occupational exposure to the notified chemical (at a concentration up to 30%) is expected. However, dermal and accidental ocular exposure to the notified chemical could occur from inadvertent drips, splashes and spills during the manual addition of the imported product to the automated blending machine at a concentration up to 30% or via incidental leaks from the blending and packaging machine transfer hoses, fittings, and/or pumps (at a concentration less than 1%). Inhalation exposure is expected to be low given the predicted low vapour pressure for the notified chemical.

Potential exposure during blending and packaging operations will be of short duration and will not occur on a daily basis. Such exposure is further limited by the use of PPE such as latex gloves, safety glasses, helmet and safety boots. All workers will undergo routine education training in chemical handling and have access to the Material Safety Data Sheet (MSDS).

End-use

Retail workers are unlikely to be exposed to the notified chemical (<1%) provided the end-use plastic containers containing the end-use products remain intact. In the event of an accident, spills will be removed in accordance with the manufacturers instructions.

Cleaning workers will be potentially exposed daily to the notified chemical however such exposure will be limited by the low level of the notified chemical (<1%) in the products and the use of gloves as required.

Overall, on the basis of the engineering controls, industrial hygiene, safe work practices and personal protective equipment (and low concentration of the notified chemical in the end-use product), occupational exposure to the notified chemical is determined to be low.

9.2.2. Public health – exposure assessment

The notified chemical will be available to the public by means of household cleaning products – including by way of spray applications. The public will be exposed potentially daily to <1% notified chemical during household cleaning tasks.

While members of the public will make dermal contact and possibly accidental ocular and inhalation (by means of spray applications) contact, such exposure is assessed as low. This is on the basis that the notified chemical is present at low concentrations in the end-use product (<1% notified chemical) and will typically be contained in high viscosity household cleaning products (that limit potential inhalation exposure). In addition, given the molecular weight of the notified chemical, absorption through intact skin is not expected.

Overall, public exposure to the notified chemical is determined to be low.

9.2.3. Human health – effects assessment

Toxicological data for the notified chemical for the following health end points were submitted:

- Eye Irritation (polymer analogue used)
- Sensitisation
- Mutagenicity

In an eye irritation test, the analogue chemical was considered as an eye irritation, however the mean scores of the eye irritation test calculated does not warrant a classification according to the criteria of NOHSC. In a guinea pig skin sensitisation (Magnusson and Kligman Method) test there was no evidence of reactions indicative of skin sensitisation to the notified chemical under the conditions of the test. A reverse mutation test in *Salmonella typhimurium* and *Escherichia coli (in vitro)* indicated the notified chemical was not mutagenic to bacteria under the conditions of the test.

Based on the available data, the notified chemical is not classified as a hazardous substance in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC 2004).

9.2.4. Occupational health and safety – risk characterisation

Dermal contact will be the main route of exposure with the potential for accidental ocular exposure. The notified chemical is unlikely to be acutely toxic, irritating or genotoxic. The imported and end-use products are not classified hazardous on the basis of the content of the notified chemical which is up to 30% and <1% of the imported and end-use products, respectively.

Blending and packaging

The OHS risk presented by the notified chemical is expected to be low, given the automated process and engineering controls implemented at blending and packaging facilities, the industrial hygiene, good work practices and safety measures including use of appropriate personal protective equipment by workers. Moreover, the notified chemical will be used at blending and packaging sites where operatives are familiar in using such products and good handling procedures and good housekeeping is the norm and workers wear personal protective equipment.

End Use

Large numbers of retail and cleaning workers will be potentially exposed on a regular basis to cleaning products containing very low levels of notified chemical. However, dermal exposure will be limited by the very low level of the notified chemical (<1%) in the products. In addition, industrial users will typically wear as required impervious gloves and protective clothing to minimise skin contact, if required.

Risk from repeated exposure is considered to be low given the molecular weight of the notified chemical is such that absorption through intact skin is not expected to be significant. While the vapour pressure of the notified chemical is predicted to be low and consequently risk of inhalation exposure is expected to be low, inhalation by means of spray-cleaners cannot be discounted. However, the risk of such exposure is assessed as low due to the low concentration of the notified chemical in the end-use products.

The notified chemical may be present in formulations containing hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

The adverse health risk for workers handling the notified chemical is assessed as low under the current circumstances.

9.2.5. Public health – risk characterisation

There will be no significant public exposure to the notified chemical given the low concentration of the notified chemical in the household cleaning products (<1%). Given the typical viscous nature of the spray cleaning products (combined with the low concentrations of the notified chemical used therein), the risk to public health from inhalation exposure to the notified chemical is considered low. Consequently, there is unlikely to be any significant public health risk posed by the notified chemical.

Therefore, based on the very low concentration and hence low potential for exposure, the risk to public health from exposure to the notified chemical is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

Based on the available data the notified chemical is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances*.

The notifier states the notified chemical may be an eye irritant and to avoid contact with skin and eyes.

As a comparison only, the classification of the notified chemical using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations 2003) is

presented below. This system is not mandated in Australia and carries no legal status but is presented for information purposes.

The notified chemical can be classified as Chronic Category 4, based on a fish test result and assuming the notified chemical is not readily biodegradable.

10.2. Environmental risk assessment

On the basis of the PEC/PNEC ratio the chemical is not considered to pose a risk to the environment based on its reported use pattern and volume.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is No Significant Concern to public health when used in household cleaning products as described.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the notified chemical provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 2003). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

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

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced:
 - Avoid contact with skin and eyes
 - Wear suitable protective clothing
 - Wear suitable gloves
 - Wear safety glasses

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Public Health

- The following measures should be taken consumers to minimise public exposure to the

notified chemical in spray applications:

- Do not breathe spray

Environment

Disposal

- The notified chemical should be disposed of to landfill.

Emergency procedures

- Spills/release of the notified chemical should be handled by physical containment, collection and subsequent disposal to landfill.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under Section 64(1) of the Act; if

- the importation volume exceeds one tonne per annum notified chemical
- a change in the manufacturing process or purity of the notified chemical
- health and/or environmental data becomes available on potential degradation products

or

(2) Under Section 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required..

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