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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

1-6184 Water Repellent

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Director
Chemicals Notification and Assessment

FULL PUBLIC REPORT

1-6184 Water Repellent

1. APPLICANT

Dow Corning Australia Pty. Ltd. of 21 Tattersall Road BLACKTOWN NSW 2148 has submitted a standard notification statement in support of their application for an assessment certificate for 1-6184 Water Repellent. No requests for exempt information were made by Dow Corning and the report is published in its entirety.

2. IDENTITY OF THE CHEMICAL

Chemical Name: silsequioxanes, [3-(2-amino-ethyl)amino] propyl Me, methoxy-terminated

Chemical Abstracts Service (CAS) Registry No.: 145775-27-5

Other Names: methoxy-functional aminosilsesquioxanes

Trade Name: 1-6184 Water Repellant

Molecular Formula: $(CH_3SiO_{3/2})_a(C_5H_{13}N_2SiO_{3/2})_b(CH_3O_{1/2})_c$

Structural Formula:

$$[CH_3\text{-}SiO_{3/2}]_a[H_2N\text{-}CH_2\text{-}CH_2\text{-}NH\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}SiO_{3/2}]_b[O_{1/2}CH_3]_c$$

Number-Average Molecular Weight (NAMW): 312

Maximum Percentage of Low Molecular Weight Species

Molecular Weight < 500: 50

Molecular Weight < 1 000: 100

Weight Percentage of Ingredients:

Chemical Name	*CAS No.*	*Weight %*
silane, trimethoxymethyl-	1185-55-3	38
1,2-ethanediamine, n-(3-(trimethoxysilyl)-propyl)-	1760-24-3	62

Method of Detection and Determination: nuclear magnetic resonance (NMR) and infrared (IR)

Spectral Data: IR, peaks were observed at ~500, 1 030, 1 200, 1 300, 1 470, 2 850, 2 940 cm^{-1}

Comments on Chemical Identity

The notified polymer is produced by pre-partial cohydrolysis of methyltrimethoxysilane and N-[3-(trimethoxysilyl)propyl]-1,2-ethanediamine. As such, no specific structure can be identified. Complete hydrolysis will not occur until fully mixed with water upon application.

3. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa: clear to slightly yellow liquid

Boiling Point: > 35°C

Specific Gravity: 1.05 at 20°C

Vapour Pressure: not determined

Water Solubility: blends with water at all ratios

Partition Co-efficient (n-octanol/water): not determined

Hydrolysis as a Function of pH: increase with increasing pH

Adsorption/Desorption: not determined

Dissociation Constant: not determined

Flash Point: 27°C (closed cup)

Flammability Limits: not determined

Autoignition Temperature: not determined

Explosive Properties: not explosive

Reactivity/Stability: will hydrolyse in water

Comments on Physico-Chemical Properties

No vapour pressure has been determined for the notified substance. The product information sheet states a maximum volatile organic content (VOC) of the product as 370 g/L. When imported, there is a 2% content of methanol, and during hydrolysis (after application), further quantities of methanol will be released.

No water solubility tests were conducted. The notifier states the chemical blends with water in all ratios. This may be expected due to hydrophilic components within the molecule. As documented in the product Material Safety Data Sheet (MSDS), the material is sensitive to moisture, and when in an aqueous solution, gives water insoluble material when applied to a substrate. This does not appear to be the case with deionised water. In high concentration (>20%), the product gels rapidly.

No testing has been conducted on hydrolysis. However, it has been shown that alkoxysilanes hydrolyse in water to give corresponding silanols, which can also condense to siloxanols {Chandra, 1993 #40}. Under optimum conditions, hydrolysis is relatively fast. In general, the hydrolysis of alkoxysilanes is usually relatively slow in neutral solution (the product has a stated shelf life in deionised water of 1 year), but is strongly catalysed by acids or alkalies {Chandra, 1993 #40}. The hydrolysis half life given for Silane, trimethoxymethyl- is given as 0.3 minutes, while that for 1,2-Ethanediamine, N-[3,(trimethoxysilyl)-propyl]- is given as 24.1 minutes {Chandra, 1993 #40}.

Partition and adsorption/desorption coefficients are not relevant due to the reactivity of the chemical. Also, there are no “active” hydrogens on the molecule.

4. PURITY OF THE CHEMICAL

Degree of Purity: 98%

Toxic or Hazardous Impurities:

Chemical name:	methanol
Synonyms:	methyl alcohol
CAS No.:	67-56-1
Weight percentage:	2%
Toxic properties:	toxic by inhalation, in contact with skin and if swallowed, harmful threshold is 3% according to Worksafe Australia's *List of Designated Hazardous Substances* {National Occupational Health and Safety Commission, 1994 #10}

Non-hazardous Impurities (> 1% by weight): none

Additives/Adjuvants: none

5. USE, VOLUME AND FORMULATION

The notified chemical will be used as a water repellant for application to substrates such as masonry, cement and wood, either alone or in blends with other water repellant substances. Volumes of 1 to 10 tonnes will be imported per year for the first five years. It will be imported in 200 L steel drums and reformulated in Australia. It will be reformulated with chemicals such as wax emulsions and diluted in water.

6. OCCUPATIONAL EXPOSURE

The imported formulation containing 98% of the notified chemical and 2% methanol will be reformulated into waterproofing products, largely by dilution with water into two product lines. The first will contain approximately 10% of the notified chemical and will be for exclusive use by skilled contractors the second will be available for retail purchase and will contain approximately 3-6% of the notified chemical.

Exposure to the imported concentrate during transport and warehousing will only occur in the event of accidental spillage or leaking. Occupational exposure will be greatest when handling the concentrate. The concentrate will be diluted with water and/ or blended with other ingredients such as wax emulsions. This operation will be vary depending on the facilities of the customer for the concentrate. The facilities will range from closed tanks with exhaust ventilation to open tanks with a hood for exhaust. Small factories usually having open containers with engineering type exhaust systems or relying on natural ventilation. Drumming of the final product will normally be under local exhaust or general ventilation. 20 to 100 chemical industry process workers will be employed in reformulation of the notified chemical. A similar number of building and building maintenance workers will be

employed in application of the commercial formulation. Application can be by either brush or spray.

The main occupational exposure pathways will be dermal and possibly ocular, the latter via splashing during reformulation. The vapour pressure of the notified chemical is unknown however the impurity, methanol, will be volatile and there is therefore the potential for inhalational exposure to the impurity. Exhaust ventilation and the use of hoods will reduce the potential for inhalational exposure.

During application of the commercial product both dermal and ocular exposure are possible when applied by brush. During spray application there is considerable potential for inhalatory exposure. The potential for significant exposure when handling materials treated with water repellant containing the notified chemical will be minimal. When cured the chemical polymerises into a relatively inert material and the impurity, methanol, evaporates.

7. PUBLIC EXPOSURE

There will be negligible potential for public exposure to the imported concentrate. The potential for public exposure arising from formulation activities is low. Two product lines will be produced. The product available for public use will contain 3-6% of the notified chemical. The main route of exposure will be dermal , with potential for additional exposure by inhalation of spraydrift when applying by spray. There would be moderate potential for exposure of domestic users, but exposure is expected to be infrequent, as the product requires re-application only every 2-5 years. An accompanying product information sheet states that 1-6184 Water Repellant is not intended for medical or pharmaceutical use.

8. ENVIRONMENTAL EXPOSURE

Release

The notified chemical will be imported where it will be blended with other chemicals such as wax emulsions and diluted with deionised water. These processes will take place at chemicals manufacturers such as paint companies. The reformulation will be carried out with standard equipment used in batch blending processes. The reformulated chemical will be packed into lined 200 or 20 L steel drums. The notifier expects that residues in import containers will account for 0.25% (0.5 kg per container). This equates to 25 kg per annum of notified chemical. During reformulation/emulsifying operations, losses are not expected to be significant due to the simple blending process. However, losses from the mixing vessel may enter the sewage system during cleaning operations.

The product is reformulated as a 5% solution, and repacked in 200 L or 20 L containers. With a further 0.25% loss as residues, this release could account for up to 25 kg per annum.

The notified chemical is present in reformulated products at between 4-20%. It is used as a penetrating sealer to impart water resistance to highly absorbent material such as brick, sandstone, grout, limestone and concrete. In addition, it can be further formulated with wax emulsions and deionised water to produce a water repellent for wood. The amount of product applied to each substrate will depend on the absorptivity of the substrate, with application to occur until the substrate is fully saturated. This is indicated in the product data sheet to be between 2.5-10 m^2/L of the end product (a potential range of 12.5-250 m^2/L of the notified chemical).

End application of the notified chemical to substrates can be by dipping, brushing, rolling or spraying. Releases to the environment during end use are stated by the notifier as minimal. When applying by brushing or rolling techniques, some release could be expected during cleaning operations. Dipping methods could result in release through dripping of excess product. This could be expected to cure once in contact with the ground.

Application to vertical surfaces such as buildings and bridges carries greater likelihood of runoff than if applied to horizontal surfaces, particularly to the aquatic compartment in the case of bridges. Assuming similar spraying techniques to those currently employed for related chemicals from this company, spraying is by low pressure sprayer sufficient to deliver the product from the nozzle to the substrate (wall). The application commences at the base of the wall with the lowest volume to obtain a zero curtain length and moves up the vertical surface with increasing volume and correspondingly longer curtain length to a maximum of 50 cm. The technique was developed in Europe and USA to obtain 100% surface application, whilst avoiding runoff to non-target areas, eliminating environmental exposure, particularly to the aquatic compartment, and keeping costs to a minimum.

The notifier has estimated total release of 1% of applied substance. With the outlined spraying method, this appears a realistic assumption, and an annual release of 100 kg through application processes can be assumed.

Total expected release from all operations (reformulation, application and cleaning) may be 150 kg per annum.

Fate

Once applied to a substrate, the hydrophilic methoxy groups hydrolyse, releasing methanol and forming a reactive silanol. This undergoes polymerisation and reacts with the inorganic surface of the building material to form a water repellent layer.

When released to a substrate such as soil, which will be the general case for releases during dipping and spraying application, the notified chemical could be expected to behave as it does when applied to other substrates, and cure rapidly to form an insoluble polymer.

There is a chance some release will occur to sewer as a result of cleaning operations. This being the case, the product could be expected to undergo rapid hydrolysis in sewer waters to release methanol, and form an insoluble material which would be removed with solids from the treatment plant and incinerated.

If released to stormwater, the insoluble material would be expected to associate with sediments and not be bioavailable.

Biochemical oxygen demand (BOD) was tested for 1,2-ethanediamine, N-[3,(trimethoxysilyl)-propyl]- (the major component of the notified chemical), at 125 ppm, and 1250 ppm. At the lower level, the test material had a BOD_5 of 53 (± 47) ppm. At 1250 ppm, a negligible BOD was recorded. The test reports states the observed BOD is probably the result of the released methanol from the chemical in water.

9. EVALUATION OF TOXICOLOGICAL DATA

9.1 Acute Toxicity

Summary of the acute toxicity of 1-6184 Water Repellent

Test	*Species*	*Outcome*	*Reference*
acute oral toxicity	rat	> 2 000 mg/kg	{Siddiqui, 1992 #30}
acute dermal toxicity	rat	> 2 000 mg/kg	{Siddiqui, 1992 #34}
skin irritation	rabbit	slight irritant	{Siddiqui, 1992 #35}
eye irritation	rabbit	severe irritant	{Siddiqui, 1992 #36}

9.1.1 Oral Toxicity {Siddiqui, 1992 #30}

Species/strain:	Sprague-Dawley rat
Number/sex of animals:	5/sex at each dose
Observation period:	14 days
Method of administration:	oral gavage, dose 2 000 and 5 000 mg/kg
Clinical observations:	at 5 000 mg/kg, excessive salivation, slight to severe lethargy, moderate ataxia, loss of body reflexes and drooping of eyelids; at 2 000 mg/kg moderate lethargy and ataxia and slight stupor

Mortality:	at 5 000 mg/kg 3M/1F, at 2 000 mg/kg 0M/2F
Morphological findings:	at both doses mortalities due to necrosis and sloughing of the gastric and intestinal mucosa; lymph node and splenic enlargement found in surviving males; at 2 000 mg/kg
Test method:	modified US EPA guideline {EPA, 1985 #32}similar to OECD guidelines {Organisation for Economic Co-operation and Development, 1995-1996 #15}
LD_{50}:	≥ 2 000 mg/kg
Result:	low acute oral toxicity

9.1.2 Dermal Toxicity {Siddiqui, 1992 #34}

Species/strain:	rabbit/New Zealand white
Number/sex of animals:	2/sex
Observation period:	14 days
Method of administration:	single occluded dose to clipped skin of 2 000 mg/kg for 24 hours
Clinical observations:	no behavioural changes
Mortality:	nil
Morphological findings:	nil
Test method:	modified US EPA guideline {EPA, 1985 #32}similar to OECD guidelines {Organisation for Economic Co-operation and Development, 1995-1996 #15}
LD_{50}:	> 2 000 mg/kg
Result:	low acute dermal toxicity

9.1.4 Skin Irritation {Siddiqui, 1992 #35}

Species/strain:	rabbit/New Zealand white
Number/sex of animals:	3 male
Observation period:	14 days
Method of administration:	3 modes I. on ear, 0.1 ml on inside of ear, 10 applications over a 14 day period 2. intact abdomen, 0.5 ml under a cotton gauze patch, taped; ten applications over a 14 day period 3. abraded abdomen, stratum corneum crosshatched and test material applied as above, 3-4 applications over a period of 4-5 days
Draize scores {Draize, 1959 #4}:	1. no scores recorded 2. erythema only positive result no oedema, exfoliation or necrosis, maximum mean value (erythema) was evaluated as “slight pink” after applications 3. erythema only positive result no oedema, exfoliation or necrosis, maximum mean value (erythema) was evaluated as “slight pink” after applications
Test method:	modified US EPA guideline {EPA, 1985 #32}
Result:	slight skin irritant, erythema only effect, this was reversible

9.1.5 Eye Irritation {Siddiqui, 1992 #36}

Species/strain:	rabbits/New Zealand white
Number/sex of animals:	3 male
Observation period:	21 days
Method of administration:	0.1 ml of 1-6184 Water Repellant in each eye, left eye washed 30 seconds after application *of unirrigated eyes:* grading response reported is similar but not exactly the same as Draize therefore where there is doubt,

such as establishing the area of cornea involved, a blank has been recorded

Draize scores {Draize, 1959 #4})

	Time after instillation									
Animal	**1 day**		**2 days**		**7 days**		**14 days**		**21 days**	
Cornea	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**
1	[1]1	-	1	-	2	-	0	-	0	-
2	1	-	1	-	1	-	1	-	0	-
3	1	-	0	-	0	-	0	-	0	-
1		-		-		-		-		-
2		-		-		-		-		-
3		-		-		-		-		-

Conjunctiva	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**
1	3	3	3	3	3	3	0	0	0	0
2	4	4	3	3	3	3	0	0	0	0
3	3	3	3	3	2	2	0	0	0	0

[1] see Attachment 1 for Draize scales
[a] opacity [b] area [c] redness [d] chemosis

Irrigated eyes:

	Time after instillation									
Animal	**1 day**		**2 days**		**7 days**		**14 days**		**21 days**	
Cornea	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**	**o[a]**	**a[b]**
1	[1]1	-	1	-	1	-	0	-	0	-
2	1	-	1	-	1	-	0	-	0	-
3	1	-	0	-	0	-	0	-	0	-
1		-		-		-		-		-
2		-		-		-		-		-
3		-		-		-		-		-

Conjunctiva	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**	**r[c]**	**c[d]**
1	4	4	3	3	3	3	0	0	0	0
2	4	4	3	3	3	3	0	0	0	0
3	3	3	3	3	2	2	0	0	0	0

[1] see Attachment 1 for Draize scales
[a] opacity [b] area [c] redness [d] chemosis

Test method:	US EPA guideline {EPA, 1985 #32}
Result:	severe eye irritant, the iris lesions are described in the report as being slight to moderate and therefore do not fall into the category of "serious eye effects" specified by the Worksafe criteria {National Occupational Health and Safety Commission, 1994 #9}

9.4 Other studies

No test results were submitted for acute inhalation toxicity, repeat dose sub-chronic toxicity, a skin sensitisation study or studies on the genotoxic potential of the notified chemical. The notifier did however submit summaries and comment on the toxicology of the predominant (62%) monomer 1,2-ethanediamine, n-(3-(trimethoxysilyl)-propyl)-, trade name Z-6020. The notifier argues that the parent compound is likely to have similar properties. The results of these studies are as follows. The notifier states that Z-6020 is a "well known" sensitiser, no report was supplied. In a *Salmonella typhimurium* reverse mutation assay using strains TA-98, TA-100, TA-1535, TA1537 and TA-1538, with and without metabolic activation, Z-6020 was not mutagenic at a maximal dose rate of 500 μg/plate {Isquith, 1977 #38}.

9.5 Overall Assessment of Toxicological Data

The notified chemical had a low oral and dermal toxicity in rats with LD_{50} values in excess of 2 000 mg/kg. No repeat dose study data was submitted. Systemic effects were evident in the acute oral study.

The chemical was not classified a skin irritant in rabbits although there was some evidence of irritation in the form of erythema. It should be noted that the test was at variance with recognised OECD methods as the chemical was applied on multiple occasions for periods of upto 14 days on unabraded skin and for 4-5 days to abraded skin.

The notified chemical was a severe eye irritant in rabbits with corneal effects including opacity, effects on the iris and significant chemosis and redness of the conjunctiva. These effects were apparent in both irrigated (30 seconds after application) and unirrigated eyes. The effects were still in evidence seven days after application but in most cases had been resolved by day 14. The scoring method used by the reports author does not strictly follow the method of Draize (see attachment 1) however it is unlikely that the chemical would be considered to cause "serious eye effects" as specified by the Worksafe criteria {National Occupational Health and Safety Commission, 1994 #9}. On the basis of the eye irritation potential the notified chemical would be classified as hazardous.

As a substitute for skin sensitisation and genotoxicity studies the notifier submitted comment and a report on the predominant (62%) component of the notified

chemical, 1,2-ethanediamine, n-(3-(trimethoxysilyl)-propyl)-, trade name Z-6020. The notifier argues that the parent compound is likely to have similar properties which is debatable. The notifier states that Z-6020 is a "well known" sensitiser, no report was supplied, in the absence of a sensitisation study on the actual notified chemical it is advisable to assume it is a sensitiser. Only one genotoxicity study was provided for Z-6020, a *Salmonella typhimurium* reverse mutation assay with and without metabolic activation. Z-6020 was not mutagenic at a maximal dose rate of 500 μg/plate. To confirm that the notified chemical is not genotoxic, tests, preferably an *in vitro* and an *in vivo* method, on the notified chemical would be necessary.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

Ecotoxicity data are required for chemicals with NAMW less than 1000 under the Act. No data were available for the notified chemical. However, data were provided for 1,2-ethanediamine, N-[3,(trimethoxysilyl)-propyl]-, which is present in the notified substance at a concentration of 68%. As with the other component, (silane, trimethoxymethyl-), it is a methoxy terminated alkoxysilane.

Table 1 - Toxicity of Dow Corning Z6020 Silane to aquatic species.

Species	Test	Result (mg/L)
Rainbow trout	96 hour static	LC_{50}=213
Bluegill sunfish	96 hour static	LC_{50}=200
Daphnia magna	48 hour static	EC_{50}=37
Daphnia magna	21 day Chronic.	NOEC = 1
Green algae (*Selanastrum capricornutum*)	Inhibitory test.	IC_{50}=1.5
Blue green algae (*Anabaena flos-aquae*)	Inhibitory test	IC_{50}>200

Tests were conducted following USEPA guidelines. All results were outlined in a single report. If these results are extrapolated to the notified chemical, they show it can be considered practically non-toxic to fish and blue green algae, slightly toxic to *Daphnia*, and moderately to highly toxic to green algae. No sub lethal effects to any species were recorded in the report.

The notified product is expected to be very unstable in water with a very short half-life. The tested product has a measured half life of 24.1 minutes {Chandra, 1993 #40} (see Physico-Chemical Properties above). Therefore, test results are likely to be for the hydroxy analogue which would have been present for most of the test period.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The main route of environmental exposure for the notified substance may occur as a result of runoff or "washoff", from concrete surfaces during application, directly to the ground or aquatic compartment in the case of bridge pylon application.

The "worst case" environmental hazard scenario will be from application to existing bridge structures where the base of the pylons are submerged in rivers or harbours. The hazard may be greatest where application is close to the water line, although it is envisaged that most use will be to new structures (pylons) before they are lowered into the water or where watercourses are diverted during construction.

The case for application to existing sea harbour bridge pylon structures in areas close to the water line requires closer scrutiny. As mentioned above, substance runoff during application is minimised given the precise techniques utilised. However, "washoff" caused by wave motion may remove some notified chemical from the concrete surfaces before strong bonding can occur.

Assuming an application rate of 0.08 L/m^2, a 1 metre swell and a pylon circumference of 10 metres, a maximum of 0.8 L of substance may be washed into the sea. The instantaneous dilution, in the event of "washoff", will be approximately 0.8 L in 200 m^3 of seawater. Subsequent wave motions and eddy effects around the bridge pylons will cause further substance dilution. Rapid polymerisation will limit its release from surfaces.

Therefore, in the unlikely event of 100% "washoff", the immediate aquatic concentration of the notified substance will be approximately 13 ppm which will be further swiftly diminished (within minutes) by a number of factors described above to concentrations which provide an adequate safety margin in light of ecotoxicity data provided.

It is unlikely that significant toxic levels of the notified substance or polymer will occur in the aquatic environment due to application methods minimising run-off; its reactivity with water; the likelihood of the notified substance and/or its condensate (polymer) binding to sediment; and the expected lack of bioaccumulation potential. Reviews of the environmental fate and effects of polysiloxanes suggest that any notified substance released to the aquatic compartment will become a permanent but biocompatible resident of sediments {Hamelink, 1992 #41}.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

The notified chemical will be imported as a 98% concentrate with a 2% impurity, methanol. It will be reformulated in Australia into products for waterproofing building materials. These products will replace more occupationally and environmentally harmful products which are either caustic or contain hydrocarbon solvents. The notified chemical contains methoxy groups and a hazardous

impurity, methanol. Methanol is an inhalatory and dermal toxin. The imported formulation would not be classified as hazardous on the basis of its methanol content as the harmful threshold is 3% according to Worksafe Australia's *List of Designated Hazardous Substances* {National Occupational Health and Safety Commission, 1994 #10}. However it would be flammable and would be labelled under the Australian Dangerous Goods Code {Federal Office of Road Safety, 1992 #5} accordingly. In addition when handling the formulation the occupational exposure standard of time weighted average (TWA) 200 ppm must be observed {National Occupational Health and Safety Commission, 1995 #14}. The molecular weight of the notified chemical, 312, would indicate that it could pass through biological membranes. The vapour pressure of the notified chemical was not determined nor was the partition coefficient. An evaluation of the bioaccumulative potential of the notified chemical is therefore difficult to assess although the high water solubility would indicate that it is not optimally predisposed for this.

Animal studies indicate that the notified chemical is of low oral and dermal toxicity but has some potential for skin irritation. It was an eye irritant in a rabbit study and on this basis would be classified as hazardous according to the Worksafe Australia criteria {National Occupational Health and Safety Commission, 1994 #9}. No specific studies were available on the sensitisation potential of the notified chemical however a study on the major component of the chemical, 1,2-ethanediamine, n-(3-(trimethoxysilyl)-propyl)-, trade name Z-6020, indicates that this is a sensitiser. In the absence of evidence to the contrary the notified chemical would be considered a probable sensitiser.

It is unlikely that significant occupational exposure will occur during transport and handling of the notified chemical unless accidental spillage occurs. Occupational exposure will occur when reformulating the imported concentrate, 1-6184 Water Repellant, and when applying products containing the notified chemical. The concentrate will be diluted largely with water and blended into products containing between 3 and 10% of the notified chemical. There is greatest potential for dermal and ocular exposure during these processes although inhalational exposure is possible where ventilation is inadequate. Atmospheric monitoring for methanol would indicate possible atmospheric exposure to the notified chemical.

As the notified chemical is an eye irritant and probable sensitiser there is significant potential for harm to occur through occupational exposure. The risk associated with these attributes indicates that, especially when handling the concentrate, exposure should be minimised through the use of appropriate personal protective equipment. The dilution in the commercial products reduces the hazard through occupational exposure however there are still significant risks. Spray application of the these products would involve significant dermal, ocular and inhalational exposure to the chemical, therefore the appropriate safety equipment must be used.

There is potential for moderate levels of exposure to 1-6184 Water Repellant among purchasers of products intended for domestic use, which will contain between 3 and 6 % of the notified chemical. Given the intended use of the product(s), exposure would probably be infrequent. Although members of the

public are likely to make contact with treated masonry, timber and concrete, by this stage 1-6184 Water Repellant will exist as a cured, inert coating which is not bioavailable.

13. RECOMMENDATIONS

To minimise occupational exposure to 1-6184 Water Repellant, when handling the concentrated formulation and when applying diluted formulations via spray application, the following guidelines and precautions should be observed:

- the appropriate respiratory device should be selected and used in accordance to Australian Standard/ New Zealand Standard (AS/NZS) 1715 {Standards Australia/Standards New Zealand, 1994 #25} and should conform to AS/NZS 1716 {Standards Australia/Standards New Zealand, 1994 #26}.

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 {Standards Australia, 1994 #21} to comply with Australian/New Zealand Standard (AS/NZS) 1337 {Standards Australia/Standards New Zealand, 1992 #23};

In addition when handling either the concentrate or when handling diluted formulations, the following guidelines and precautions should be observed:

- Industrial clothing should conform to the specifications detailed in AS 2919 {Standards Australia, 1987 #18} and AS 3765.1 {Standards Australia, 1990 #19};

- Impermeable gloves or mittens should conform to AS 2161 {Standards Australia, 1978 #17};

- All occupational footwear should conform to AS/NZS 2210 {Standards Australia/Standards New Zealand, 1994 #24};

- Spillage of the notified chemical should be avoided, spillages should be cleaned up promptly with absorbents which should then be 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.

- At all times the occupational exposure standard for methanol of TWA 200 ppm (262 mg^3) should be observed

Products containing the notified chemical which are are marketed to the public, should direct users to avoid contact with the skin and eyes.

14. 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 #13}.

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.

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.

Attachment 1

The Draize Scale for evaluation of skin reactions is as follows:

Erythema Formation	*Rating*	*Oedema Formation*	*Rating*
No erythema	0	No oedema	0
Very slight erythema (barely perceptible)	1	Very slight oedema (barely perceptible)	1
Well-defined erythema	2	Slight oedema (edges of area well-defined by definite raising	2
Moderate to severe erythema	3	Moderate oedema (raised approx. 1 mm)	3
Severe erythema (beet redness)	4	Severe oedema (raised more than 1 mm and extending beyond area of exposure)	4

The Draize scale for evaluation of eye reactions is as follows:

CORNEA

Opacity	*Rating*	*Area of Cornea involved*	*Rating*
No opacity	0 none	25% or less (not zero)	1
Diffuse area, details of iris clearly visible	1 slight	25% to 50%	2
Easily visible translucent areas, details of iris slightly obscure	2 mild	50% to 75%	3
Opalescent areas, no details of iris visible, size of pupil barely discernible	3 moderate	Greater than 75%	4
Opaque, iris invisible	4 severe		

CONJUNCTIVAE

Redness	*Rating*	*Chemosis*	*Rating*	*Discharge*	*Rating*
Vessels normal	0 none	No swelling	0 none	No discharge	0 none
Vessels definitely injected above normal	1 slight	Any swelling above normal	1 slight	Any amount different from normal	1 slight
More diffuse, deeper crimson red with individual vessels not easily discernible	2 mod.	Obvious swelling with partial eversion of lids	2 mild	Discharge with moistening of lids and adjacent hairs	2 mod.
Diffuse beefy red	3 severe	Swelling with lids half-closed	3 mod.	Discharge with moistening of lids and hairs and considerable area around eye	3 severe
		Swelling with lids half-closed to completely closed	4 severe		

IRIS

Values	*Rating*
Normal	0 none
Folds above normal, congestion, swelling, circumcorneal injection, iris reacts to light	1 slight
No reaction to light, haemorrhage, gross destruction	2 severe