ACN 010 988 931

SCI-PLAN PTY LTD

Planning a Future for Australia

SOKEROL

TECHNICAL REPORT

PREPARED for

Sokerol Australia Pty Ltd

PREPARED by

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HEALTH /SAFETY DATA SHEET

SOKEROL OIL/CHEMICAL ABSORBENT

100% ORGANIC. THE SAFE AND EASY TO USE OIL/CHEMICAL ABSORBENT ON LAND AND ON WATER.

SOURCE OF MATERIAL		A milled by-product of the Queensland Softwoods Industry.
CHEMICAL COMPOSITION		Plant organic matter with 1.5% ash content
PHYSICAL DATA	Appearance	A dry mixture of fibres and particulates
	Bulk Density	Approximately 0.3kg/L
	Particle Sizes	75 microns particles < 3.25% of product weight 5 microns particles < 0.012% of product weight
FIRE & EXPLOSION		Not normally subject to spontaneous combustion No known explosive tendency Complies with A.S.T.M.C-739 1984
REACTIVITY		Stable Biodegradable Reacts with strong oxidising agents
STORAGE & HANDLING		No special protection precautions required but store in dry conditions
HEALTH	Eye contact	Treat as for any 'neutral' foreign body Wear goggles if necessary
	Skin contact	No known effects
	Inhalation	< 1% respirable wood dust Exposure standard in an occupational environment not to exceed 5mg/m^3
	Ingestion	No known effects
OIL ABSORBANCY RATES		Approximately 1L/kg of its own weight
DISPOSAL		Brush or broom material into containers for normal land-fill disposal Oil saturated **Sokerol** can be safely disposed to lined and unlined landfill sites

SOLE MANUFACTURERS OF THE SOKEROL RANGE OF PRODUCTS.
ACN 106 011 063 Sokerol (Australia) Pty Ltd, Post Office Box 1740, Noosa Heads, Qld 4580.
Telephone: (07)5440 5488 Facsimile: (07) 5440 5499

Properties

Sokerol is a natural milled wood fibre generated as a by-product of the Queensland Softwoods Industry. Its physical and chemical properties are typical of milled vegetable material.

Sokerol is not toxic and is neither known, nor expected to be, carcinogenic. Whilst it is a mixture of fibrous and particulate matter, only 3.5% of the particulate matter is less than 75 microns and 0.012% less than 5 microns in size. Tests by the Government Chemical Laboratory indicate that **Sokerol** contains less than 1% respirable wood dust, with an exposure standard in an occupational environment not to exceed 5mg/m^3**. (Appendices 1 and 2**)

It has a specific gravity of 1.24kg/L and a natural bulk density of approximately 0.3kg/L. The fresh product contains about 5% moisture by weight and has an ash content of 1.5% by weight. The material is difficult to ignite, requiring a critical radiant flux of 0,14W/cm^2 for ignition. It is not subject to spontaneous combustion and has an ignition temperature of 75°C. Organic pesticide and herbicide residues are present in the milled material at less than 0.1mg/kg(material). (**Appendices 1, 3 and 4**)

Sokerol is chemically inert. Tests have been conducted on the reactivity of **Sokerol** with a number of reagents. The results, shown below, indicate that it will react with strong oxidising agents such as nitric acid or damp calcium hypochlorite. (**Appendix 5**)

Reagent	Properties	Observations
water	neutral	no observed reaction
880 ammonia	alkali	no observed reaction
triethanolamine	alkali	no observed reaction
pyridine	alkali	no observed reaction
50% sodium hydroxide	alkali	chars slowly with slight temperature rise
acetic acid	acid	no observed reaction
50% hydrochloric acid	acid	no observed reaction
50% sulphuric acid	acid	darkens and chars
conc. sulphuric acid	acid	chars with some heat evolved
conc. nitric acid	acid, oxidising agent	nitrous fumes and heat evolved
50% nitric acid	acid, oxidising agent	darkening of material
100V hydrogen peroxide	oxidising agent	sample became solid
calcium hypochlorite powder	oxidising agent	no observed reaction when dry violent reaction when damp

Tests have been conducted on the absorbance of agricultural herbicides and pesticides by **Sokerol**. *Maldison* and *Demeton-S-methyl* insecticides and *Trichlorofon and Endothal*, dissolved in both solvents and diluted in water, were safely absorbed with no adverse reactions observed. (**Appendix 5**)

A Table of common products, indicating those, which can and cannot be safely absorbed by **Sokerol**, is provided below.

2-Butanone	Copper (II) Sulphate 5 Hydraft	Nitric Acid
Acetanilide	Cresisan	Orthophosphoric Acid
Acetic Acid	Cyclo power	Orthosan
Acetone	Cyclphes	Orthasan
AF 50	Di-Ammonium Iron (II) Sulphate 6 Hydrate	Perchloric Acid
AF 50	Di-Sodium Tetraborate	Petroleum Spirit 40-60 Deg
Agriphor	Diethyl Ether	Phenolphalein
Agriquat	Dimethyl Formamide	Phosphoric Acid
Agrisan	DTE 25 Oil Heavy	Polymeric disp 5
Anhydrous ammonia	Ethanol	Polyphen 50
Alderspray	Fenitrothion	Potassium Iodate
Ammonia Solution 25% / 33%	Folithion	Potassium Iodide
Ammonium Iron (iii) Sulphate 12 Hydrate	Floorsafe Anti slip cleaner	Potassium Nitrate
Ammonium Oxalate	GPD	Potassium Permanganate
Ammonium Thiocyanate	GPD5	Potassium Sulphate
Anti Bac	Halosan	Protosolv
Bactricide	Handsan	Quatracide
BD20	HD 50	Roundup
Benzoic Acid	Hydrochloric Acid	Royal Foam
BK75	Hydrogen Peroxide Solution	Salvodine
Boilerguard A	Hypo 10	Scalex
Boilerguard AA	Inhibited descaling acid	Shane
Boilerguard CS2	Iodine indicator	Smoke House
Boning room mix	Iodine Iodate	Smoke House Cleaner
Boning room mix	Kieldahl Catalyst Tablets Selenium	Sodium Hydroxide
Bromakil	Kwiksan	Sodium Hypochloride
Calcium Carbonate	Lead (II) Acetate	Sodium Metal Dry
Carbon Tetrachloride	Liquid caustic soda	Sodium Thiosulphate 5 - Hydrate
Catonic Hand Cleaner	Liquid smoke house cleaner	Sulphuric Acid
Chlorfoam	Metal bright	Topax
Chloroform	Methanol	Towerguard 3
Chlortan 16	Microcide	Towerguard 450
Churnshine	Microphor	Towerguard 5
Cislin	Mobil clear 636	Urea
Citric Acid Monohydrate	N-Hexane and Hexane Fractions	Vanquish
Complete	Nicontinic Acid	Zerice S68
Note: Items so marked are not compatible with Sokerol		

Absorbency

Because the bulk density of **Sokerol** may increase during prolonged periods of storage, absorbency is recorded as the volume of liquid absorbed per unit mass of **Sokerol**. The ability of **Sokerol** to absorb a variety of liquid hydrocarbons has been tested by placing liquid hydrocarbons in contact with **Sokerol** for periods of two (2) minutes. The volume of hydrocarbon absorbed per unit mass of **Sokerol** is shown below. (**Appendices 6 and 7**)

	Litres absorbed / kg(**Sokerol**)
Unleaded petrol	0.92
Diesel distillate	0.88
Lubricating oil	0.75
Gear oil	0.81
Hydraulic oil	0.68
Industrial gear oil	0.84
Butanol	1.52
Chloroform	1.36
Xylene	1.46

A longer contact time, or mechanical mixing, will increase the volume of hydrocarbon absorbed by unit mass of **Sokerol**.

The total allowable leaching contaminant levels by Brisbane City Council in approved unlined and lined municipal landfills are 25,000 µg/L and 50,000µg/L respectively. Petrol, oil and diesel were mixed with Sokerol at a rate of 1.4L/kg, and 100g of each mixture was subject to weak acid (pH 4.9) extraction for 18 hours at 30 rpm in a rotary TCLP extraction apparatus. The test results are shown below. (**Appendix 8**)

	Leaching hydrocarbon fraction			
	<C10	C10 - C14	C15 - C28	C29 – C35
	Concentration in leachate – µg/L			
Petrol	257	938	<10	<10
Oil	252	<10	<10	<10
Diesel	266	33	<10	<10

Sokerol can conservatively absorb 1L/kg of hydrocarbon. The resulting mixture is suitable for disposal in an unlined, or lined, Brisbane city Council municipal landfill.

Disposal to Landfill Site

Advice from the Environmental Protection Agencies in Queensland, Tasmania and the Northern Territory has been received (see **Appendix 9**) that amounts of up to 100 kgs (approximately 0.1 cubic metres) can be disposed to landfill provided that:

- there is no free liquid associated with the spent absorbent (that its absorbency has not been exceeded)
- that the nature of the liquids absorbed are known and will readily biodegrade
- that liquid contained in the absorbent is not readily leachable
- the material is not mixed with other waste.

For the smaller quantities of absorbent, the disposer should comply with their duties under the Environmental Protection Act (their general duty of environmental care). For amounts greater than 100 kgs, disposal should be dealt with by an appropriately licensed waste treatment company.

Guidelines provided by the EPA in New South Wales[1 & 2] and Western Australia[3] will allow similar quantities of spent Sokerol to be disposed to landfill, with larger quantities being required to be processed by an appropriate licensed waste disposal manager.

Whilst no specific advice was provided by the South Australian EPA, they have provided some information on the Guidelines for major solid waste landfill depots[4]. Additional information provided by them on the *Integrated Waste Strategy for Metropolitan Adelaide 1996 – 2015*[6] and *South Australia Landfill Audit 2000*[5] indicate that disposal to landfill in South Australia would carry similar restrictions to those indicated by the Queensland, Northern Territory and Tasmania Agencies.

No guidelines have been provided by the Victorian EPA. They have advised that where Sokerol is used to absorb waste classified under the Environment Protection (Prescribed Waste) Regulations 1998[7] it must be disposed of as a prescribed industrial waste to an EPA licensed facility. A list of licensed facilities is available on the EPA database[8].

1 www.austlii.edu.au/au/legis/nsw/consol_act/poteoa1997455
2 www.epa.nsw.gov.au/download/waste_guide.pdf
3 www.environ.wa.gov.au/downloads/Waste_Management/Solid_Waste_to_Landfill.pdf
4 www.environment.sa.gov.au/epa/pdfs/swlandfill.pdf
5 www.environment.sa.gov.au/epa/pdfs/front.pdf
6 www.environment.sa.gov.au/epa/pdfs/landfill_1.pdf
7 http://epanote2.epa.vic.gov.au/EPA/Publications.nsf
8 www.epa.vic.gov.au/industry/iwdb

Summary

Sokerol is an inert natural plant product that can be stored and handled without risk.

Sokerol is generally unreactive, but should not be used as an absorbent for strong oxidising agents.

Sokerol can absorb, by simple contact, approximately 0.8L/kg of hydrocarbons in two minutes. With a longer contact time, or mechanical mixing, this can increase to greater than 1.4L/kg.

Absorbed hydrocarbons are not readily leached from **Sokerol**, and the mixture is suitable for disposal to both unlined and lined municipal landfills.

The Environmental Protection Agencies in Queensland, Tasmania and Northern Territory (See **Appendix 9**) considers that the disposal of **Sokerol** to licensed landfill sites constitutes a minimal risk to the environment and have approved unlicensed disposal of up to 100 kg of **Sokerol** at such sites.

Appendices

Appendix 1: Letter from Occupational Health Unit, Brisbane Office - dated 22.2.89.

Appendix 2: Report on tests carried out on random samples of **Sokerol** supplied to East Melbourne Laboratories Pty Ltd - dated 9.10.86.

Appendix 3: Report on tests carried out on random samples of **Sokerol** supplied to EML (Chem) Pty Ltd - dated 21.11.96.

Appendix 4: Report on tests carried out on random samples of **Sokerol** supplied to Australian Wool Testing Authority - dated 5.12.86.

Appendix 5: Report on tests carried out on random samples of **Sokerol** supplied to Sharp & Howells Pty Ltd – dated 20.11.87

Appendix 6: Report on tests carried out on random samples of **Sokerol** supplied to Dandenong Valley Authority - dated 17.11.86

Appendix 7: Report on tests carried out on random samples of **Sokerol** supplied to the Food & Agricultural Labs of Australia Pty Ltd - dated 29.4.87.

Appendix 8: Report on tests carried out on a random sample of **Sokerol** supplied to Envirotest Pty Ltd - dated 16.7.99.

Appendix 9: Letters from the Environmental Protection Agencies in Queensland, Tasmania and Northern Territory.